DOCUMENT RESUME

ED 443 979 CE 080 536

AUTHOR Ryan, Christopher
TITLE Where to Next? Graduate Outcomes from the Australian Higher Education and Vocational Education and Training Sectors.
INSTITUTION National Centre for Vocational Education Research, Leabrook (Australia).
SPONS AGENCY Australian National Training Authority, Melbourne.
ISBN ISBN-0-87397-614-2
PUB DATE 2000-00-00
NOTE 71p.
AVAILABLE FROM National Centre for Vocational Education Research, 252 Kensington Road, Leabrook, South Australia 5068, Australia; Tel: 08 8333 8400, Fax: 08 8331 9211, E-mail: vet_req@ncver.edu.au; Web site: http://www.ncver.edu.au ($35.20 Australian). For full text: http://www.ncver.edu.au/cgi-bin/gda.pl?id=1622
PUB TYPE Reports - Research (143)
EDRS PRICE EDRS Price MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *College Programs; Developed Nations; Educational Finance; Educational Improvement; *Employment Level; Foreign Countries; Government Role; Graduate Surveys; *Job Training; *Outcomes of Education; Postsecondary Education; *Program Effectiveness; *Vocational Education; Vocational Followup
IDENTIFIERS *Australia

ABSTRACT

A study of the Australian higher education and vocational education and training (VET) sectors analyzed their education and training outputs (the education and training services and products provided by the sectors to other persons or entities) and outcomes (the effect of completion of a course provided by a sector for its clients). Data were derived from published national sources for the destinations of 1997 graduates in early 1998 to address the research questions in the study. Findings were extensive; some highlights include the following: (1) there is little difference in outcomes between the percentage of graduates from each sector employed following their courses; (2) in both sectors, employment outcomes are better for those completing higher level qualifications; (3) higher education graduates are concentrated in professional occupations while VET graduates are more evenly distributed across occupations, and this partially accounts for the higher wages of higher education graduates; (4) prior work experience enhanced employment outcomes, although holding a previous degree did not; (5) male and female higher education graduates enjoy similar positive outcomes, while male vocational education graduates fare much better than females; (6) although higher education graduates sometimes fared better than vocational training graduates, the differences could often be traced to major disadvantages of the vocational students before beginning study. Implications for government policy include maintaining educational subsidies for the public sector and adding employment activities during the course of study to improve employment outcomes. (Contains 32 references.) (KC)

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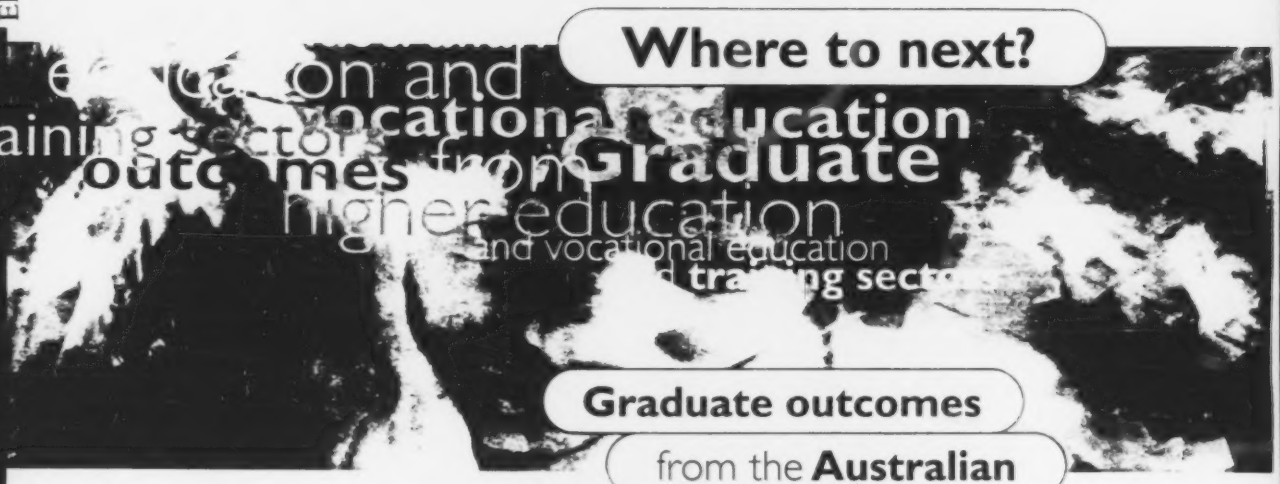

Graduate outcomes from the Australian higher education and vocational education and training sectors

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Where to next?

Graduate outcomes from the Australian higher education and vocational education and training sectors

Christopher Ryan

NCVER

This report is the result of a project undertaken by the LifeLong Learning Network, University of Canberra, for NCVER, in 1999.

The LifeLong Learning Network can be contacted as follows:
Dr Louise Watson, Research Fellow
Faculty of Education
University of Canberra, ACT 2601
Phone 02 6201 5357
Fax 02 6201 5372
Email LLLnetwk@education.canberra.edu.au

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ISBN 0 87397 614 2 print edition
0 87397 615 0 web edition
TD/TNC 62.11

Published by NCVER
ABN 87 007 967 311
252 Kensington Road, Leabrook, SA 5068
PO Box 115, Kensington Park, SA 5068, Australia

Quality Endorsed Company

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Acronyms

ABS	Australian Bureau of Statistics
AQF	Australian Qualifications Framework
ASCO	Australian Standard Classification of Occupations
AWE	average weekly earnings
BLMR	Bureau of Labour Market Research
CEQ	course experience questionnaire
DEET	Department of Employment, Education and Training
DETYA	Department of Education, Training and Youth Affairs
DEETYA	Department of Employment, Education, Training and Youth Affairs
EFTS	equivalent full-time student
EFTSU	equivalent full-time student units
GCCA	Graduate Careers Council of Australia
GDS	graduate destination survey
HE	higher education
NCVER	National Centre for Vocational Education Research
SES	socio-economic status
SEUP	Survey of Employment and Unemployment Patterns
TAFE	technical and further education
UG	undergraduate
VET	vocational education and training

Executive summary

This report analyses the education and training outputs and outcomes of the Australian higher education and vocational education and training (VET) sectors. By 'outputs' we mean the education and training services and products provided by the sectors to other persons or entities, while by 'outcomes' we mean the effect of completion of a course provided by a sector for its clients. We use evidence on the post-course activities of a sector's clients as indicators of its outcomes.

We review the relevant data collections of the two sectors, finding that the outcome data from the sectors' graduate destinations surveys provide a better basis for comparisons than output data from administrative collections. In the main, we use data from the published national sources for the destinations of 1997 graduates in early 1998 to address the research questions in this study. In addition, we analyse individual-level graduate destination data from one metropolitan multi-sector institution. This allows us to control for individual differences that influence these outcomes, as well as minimising the effect on the comparisons of potential differences in teaching approaches, facilities and student services across the sectors.

The key research questions addressed in this report are set out below, along with a summary of our findings on each point.

Which courses appear to have the best employment outcomes and why?

- In terms of aggregate outcomes, there are not substantial differences between the percentage of graduates from each sector employed following their courses (over 70% in both sectors—sections 4.2 and 6.3). This similarity remains when we take account of individual differences, including graduates' pre- and within-course employment activities.
- In both sectors, the employment outcomes are better for those completing higher level qualifications (section 4.2).
- Graduate employment outcomes by broad field of study tend to be similar in the two sectors. Graduates from architecture and building, engineering and health, and community service courses tend to have above-average employment outcomes, while those from humanities and science tend to have below-average employment outcomes. The employment outcomes for some technical and further education (TAFE) multi-field qualifications are very low (section 5.2).
- Graduates of higher education courses obtain jobs in different occupations from those of VET courses. Higher education graduates are concentrated in professional occupations (two-thirds work as professionals), while VET graduates are more evenly distributed across occupations—although many (one-third of them) work as tradespersons (section 4.3).
- Graduates of higher education courses obtain higher paid jobs than graduates from VET courses. However, at least some of this difference appears to reflect the differing occupational distributions of the two sets of graduates (section 4.4).

- TAFE graduates' employment outcomes are influenced by the regional labour market where they lived, whereas higher education graduates' are not. Employment outcomes are higher among Australian-born TAFE graduates, but not higher education graduates (section 6.3).

To what extent are education and employment outcomes linked to the prior education and employment status of the student?

- The prior education qualifications and employment experience of graduates are important determinants of their post-course outcomes. Graduates with prior full-time work experience have better employment outcomes than those who were not working full time before their course. However, holding a previous qualification did not improve graduates' employment outcomes, and may possibly have harmed them in the case of females. This latter effect may arise if employers treat an under-utilised initial qualification as a signal of previous potential employers' assessments of individuals (sections 4.2 and 6.3).
- Those with employment experience during their courses, primarily full time, had better employment outcomes than those who did not work (section 6.3). In like manner, those undertaking courses with a significant, structured work experience component had better employment outcomes than those from other courses (section 6.3). Both this effect and the within-course employment effect operated independently of individuals actually remaining with the same employer.
- Individuals with previous qualifications were more likely to continue with further study in the year following completion of their course (section 6.4). A higher proportion of VET graduates undertook a further course than higher education graduates (39% compared with 27%—sections 4.2 and 6.4).
- Individuals' experiences in their course, as reflected in their course experience questionnaire (CEQ) responses, influenced their subsequent course participation. For example:
  - those higher education graduates who undertook a further course, but were unhappy with the assessment methods in their previous course, were more likely to change institutions to continue with their studies
  - females who were studying and were satisfied with the teaching approach in their course did not change institutions (section 6.4)
  - TAFE graduates who had a poor assessment of their course's employment role and who undertook a further course of study for a higher level qualification often did so in new fields of study

Are the outcomes for specific social groups similar in each sector?

- Employment outcomes for males are quite similar between the sectors, although the graduates of the two sectors work in different occupations and higher education graduates earn more (sections 5.2 and 6.3).
- Females have quite different employment outcomes from the two sectors. Female higher education graduates enjoy employment and occupational outcomes that are similar to male graduates, though they get paid slightly less (sections 5.2 and 6.3). By contrast, female VET graduates experience much lower employment outcomes than male graduates (13 percentage points lower—section 5.2), apparently reflecting both their concentration in poorer performing fields of study and their lower pre- and within-course employment rates than males (section 6.3).

- Males and females continue with further study in the year following completion of their course in broadly similar numbers within the two sectors (sections 5.2 and 6.4).
- Older graduates have poorer employment outcomes than younger ones and, among higher education graduates, were less likely to continue with further study in the year following completion of their course (sections 5.2 and 6.3). Some specific groups of TAFE graduates, notably young male graduates who completed trade-related qualifications, appear to have low continuation rates.

What are the limitations of cross-sectoral comparisons of outputs and outcomes?

- There are two main limitations of comparisons between the sectors and one limit on our ability to undertake them. We are limited by the comparability of the data. This is more of an issue for comparing the outputs of the sectors than the outcomes, though even the destination surveys of the sectors contain important differences in data definitions. In addition, the presentation of the destinations data is quite different between the sectors. The presentation style of the higher education publications supports 'yardstick' competition between institutions, while that of the VET sector gives greater emphasis to the outcomes of different client groups and of those completing different qualifications.
- The first limitation to the act of comparing the sectors is that they may be fundamentally different in terms of their objectives and activities. That does not appear to be the case here. The differences in the national destinations data of the sectors appear to be no greater than those found in the data of the single institution we analyse, where the higher education and VET departments are integrated within the same faculty management structures.
- The second limitation in comparing the sectors is that the performance measures used in both sectors might be inadequate. It could be that neither sector provides a satisfactory benchmark. Where one sector performs better than another in some dimension, its performance may still be unsatisfactory against some external criteria. Since graduate employment outcomes are the major focus of this report, we use a longitudinal survey by the Australian Bureau of Statistics (ABS) of the employment outcomes of individuals seeking work in the broader labour market as an external benchmark. The ABS study tracked these job seekers over a two-and-a-half-year period.

In general, the employment and occupational outcomes of graduates exceeded those of the ABS job seekers. However, TAFE graduates who were unemployed or not in the labour force before their course had poorer employment rates than the ABS job seekers, but higher rates than the most disadvantaged groups of ABS job seekers (section 4.2).

Implications for research

The findings in this report point to three directions for research. The first is to determine how representative the findings from the analysis of the data from one institution are for the sectors more generally. This would require repeating the type of analysis undertaken here for larger samples from the national destination surveys.

The second direction is to look in a more detailed way than has been done here at the role of student experiences, as measured by their CEQ responses, on their subsequent education participation. While institutions' CEQ scores from the destination surveys form part of the discreet yardstick competition for new students now prevalent among higher education institutions, they also reflect the assessments of a significant continuing market for institutions' courses. Knowing what factors are important in continuing students' choices between institutions, course levels and fields of study is obviously of considerable importance to institutions in focussing improvements in their courses in both sectors. Identifying

strategies to increase further participation among low-continuation groups of VET students could also help that sector.

The third direction for research is to identify factors that might improve the employment outcomes for women in TAFE. Identification of successful strategies within institutions that improve those outcomes could assist other institutions in lifting female outcomes more generally. One approach presently pursued by women who are dissatisfied with their courses' *employment role* in TAFE is to undertake higher level courses in different fields. This strategy appears unlikely to succeed since other results presented here suggest that having an unutilised previous qualification does not add to, and may detract from, female employment outcomes. The poor employment outcomes for previous qualification holders is reflected more broadly for males and females in the national TAFE data, so it may well be a problem for other disadvantaged groups in the VET student population.

Policy implications

There are four main implications for policy from this report. First, existing government subsidies to the higher education and VET sectors allow the operation of sectors from which graduates obtain employment at better rates than those found by job seekers in the broader population. This supports an argument for maintaining these subsidy levels to the sectors.

Second, if the employment outcomes of the sectors are similar (leaving aside differences in occupational outcomes), but the marginal cost per place are not, and broad employment outcomes are the primary objective of governments, they could allocate marginal funding towards the least cost sector.

Third, post-course employment outcomes for graduates can be improved by assisting students into employment activities during their courses. Both actual employment during their courses, either full or part time (among higher education students), along with structured work experience through sandwich years, appear to improve employment outcomes, independently of students remaining with the same employers. This experience could be facilitated through either a restructuring of courses to include a work experience element or the re-direction of student employment services towards facilitating within-course employment.

Fourth, employment outcomes for some groups in TAFE require considerable attention: notably females and those individuals who complete TAFE multi-field of study courses. Once more, the development and/or re-direction of student employment services towards facilitating within-course employment might improve those outcomes. Such services are often poorly resourced within TAFE institutions.

1 Introduction

Australians, through their governments and more directly themselves, invest a great deal of money in education and training. That investment provides a range of social, cultural and economic benefits to individuals and to the nation.

Since the late 1980s, a substantial expansion has occurred in the participation of young Australians in post-compulsory education; that is, beyond the minimum school leaving ages set down in relevant State and Territory legislation. That increased participation has occurred in all forms of education: schools, vocational education institutions and universities.[1] Governments and individuals, through greater private contributions for their education, have funded this increase.

Governments have placed greater reporting requirements on education institutions to increase public accountability for education and training expenditure. Individuals should also be able to use information on the 'performance' of institutions in making their decisions about their potential education and training activities.

As more data on aspects of the performance of the education sectors are collected and analysed, it is inevitable that comparisons will be made between the sectors. Governments may use such information to determine where incremental funding takes place, while individuals—in theory—have always made implicit or explicit assessments of what competing sectors and institutions potentially offer them in their post-compulsory education decisions.

Competition for funding, whether from public, private or international sources, both between and within sectors, is now a central feature of the Australian education and training system.

This report makes use of recent improvements in the breadth and quality of the data collected in the higher education and vocational education and training (VET) sectors in Australia to compare some aspects of the 'performance' of the sectors. Our primary purpose is to compare the employment and education and training outcomes of the sectors, to the extent that the data allow such comparisons. We make use of the 1998 destination surveys of the two sectors to compare the sectors' outcomes. We also utilise administrative collections to compare their outputs.

The next section sets out the research questions we address in this report and the methodology we adopt in answering them. In section 3, we describe and compare the national data sources for the higher education and VET sectors we utilise. Section 4 describes the aggregate national output and employment, occupational, wage and education outcomes for graduates of the two sectors, while in section 5 we analyse these outcomes for some specific groups and different courses within the sectors. In section 6 we use individual-level data from one institution to identify the determinants of some of the outcomes we identified in the earlier sections. The conclusion identifies some of the implications for research and policy arising from these results.

2 Background and methodology

In this section, we set out the research questions we address in the report and our approach to answering them. This report analyses the outputs and outcomes of the Australian higher education and VET sectors. The key research questions addressed in this report follow.

- Which courses appear to have the best employment outcomes and why?
- To what extent are education and employment outcomes linked to the prior educational and employment status of the student?
- Are the outcomes for specific social groups similar in each sector?
- What are the limitations of cross-sectoral comparisons of outputs and outcomes?

To answer these issues, we:

- briefly review the extent to which existing data sources allow comparisons of outputs and outcomes across the sectors (section 3)
- summarise the key measures of sectoral outputs (section 4.1)
- analyse the published 1998 graduate destination surveys (GDS) of the VET and higher education sectors to ascertain broad national employment and education outcomes (section 4.2). The occupations of graduates and their salaries are analysed in section 4.3
- use the published data to assess the employment outcomes of courses, in terms of qualification levels and fields of study (section 5.1)
- compare the outcomes across the sectors for males and females and younger and older graduates (section 5.2)
- conduct an analysis of the employment and education outcomes of the graduates from one metropolitan, multi-sector institution (section 6)

The last element of the methodology allows a very direct comparison of the outcomes across the sectors, reducing the differences that might arise from institutional factors. The approach may also reduce, but not eliminate, differences in the students observed in the sectors. In this way, comparisons of the contribution of the education and training courses students undertake to their education and employment outcomes may be more sharply defined. However, since multi-sector institutions account for a small proportion of graduates, the results may not be representative of either sector. Nevertheless, the approach appears to control for several of the differences between the sectors that hinder comparisons.

2.1 Outputs and outcomes

Throughout the text, where we refer to education and training outputs, we mean the education and training services and products provided by the sectors to other persons or entities. While education and training institutions support other activities, our specific focus is on the number of student teaching units they produce however these units are defined. Similarly, our focus on outcomes is limited to the education and training outcomes of the sectors. Clearly, institutions provide research, social and cultural outcomes for the community. However, the outcomes that we analyse are those that reflect the effect of completion of a course provided by a sector for its clients. We use evidence on the post-course activities of a sector's clients as indicators of its outcomes. Of course, not all clients of the

sectors complete courses. Some students, particularly in VET, enrol with the intention of completing only units or modules, rather than courses. The outcomes of those students are not measured in the data on those who complete courses.

Where we refer to employment outcomes, we simply mean whether graduates were working when surveyed following their course. Also, where we refer to education and training outcomes, we have a very narrow definition in mind. We mean whether individuals were engaged in a further course of study in the year after completing their course. We do report aggregate student satisfaction levels where they are relevant, but have no other measures of education outcomes available to us.

3 Comparison of data sources for the sectors' outputs and outcomes

In this section, we describe and compare the national data sources for the higher education and VET sectors we utilise. We deal first with the output-related data and then with the data that we use as indicators of the sectors' outcomes.

3.1 Output data: Administrative collections

The data sources for the outputs of the higher education and VET sectors are administrative collections. Data on the outputs of the higher education sector are collected and published by the Commonwealth Department of Education, Training and Youth Affairs (DETYA). DETYA publishes information on higher education students, staff and finance, which includes revenue and expenditure information. These data relate only to those institutions that receive Commonwealth Operating Grants. Consequently, it excludes the operations of private universities, such as Bond University, and other higher education providers, such as religious colleges and the like.

The main student output data for higher education are course completions, student load and student enrolments. The student load figure provides the main indication of the quantity of education services provided by the sector. It involves the conversion of student enrolments into a measure of their equivalent full-time student units (EFTSU). The student enrolment numbers represent enrolments as at the census collection date, in late March in each year. The student load data include load for students undertaking units in either semester of the relevant year or in the summer school preceding the census date. Course completers in any year are all those who successfully fulfil the academic requirements of a course of study.

The National Centre for Vocational Education Research (NCVER) publishes data on VET sector outputs (NCVER 1999). It covers all VET delivery by technical and further education (TAFE) institutions and other government providers, registered community providers, some VET delivered in schools and publicly funded delivery by private providers. It excludes fee-for-service delivery by private providers. Output information is provided on the number of clients, course and module enrolments and module annual hours, the main measure of delivery of VET services. The number of clients includes all those enrolled at any time in the year.

Unfortunately, the administrative collections of the sectors do not provide comparable data. The enrolment data are collected on different bases, at a point of time in the case of higher education and at any time in the year in the case of VET, and the main measures of activity, student load and module annual hours, are not readily comparable. Burke (1995) makes use of Australian Bureau of Statistics (ABS) data on student participation in education and training to compare the sectors. These data allow more consistent comparisons in the sectors' activities.

3.2 Outcome data: Graduate destination surveys

Surveys of graduates following completion of their course are undertaken in both sectors. The higher education sector destination survey is published by the Graduate Careers Council of Australia (GCCA 1999a) and has a long history. By contrast, the first VET sector GDS was

conducted in 1995 (a survey of 1994 graduates). VET sector results for 1997 graduates in 1998 are published in NCVER (1998).

The higher education graduate destination survey

The 1998 higher education GDS covers individuals who qualified for the award of a degree or diploma from an Australian university in 1997. The survey is a census of all such graduates. Those who completed their course in the first half of 1997 were surveyed in October 1997, while those who completed their courses in the second half of 1997 were surveyed at the end of April 1998. Much of the analysis in the published report refers to Australian citizens and permanent residents only.

The focus of the survey questionnaire is on the post-course labour market and education activities of graduates. Graduates provided information on their personal characteristics and were asked about their education qualifications prior to undertaking their course. They were asked about their labour market activities during the last year of their course. In addition, graduates provided responses to a series of statements about their course that reflected their assessment of it. These statements are known as the course experience questionnaire (CEQ) and are used by the GCCA to prepare a separate report (GCCA 1999c).

The institutions sent out the questionnaire and either coded the responses themselves according to GCCA instructions or provided the data direct to the GCCA for coding. In 1998, 130 230 Australian citizens or permanent residents completed an Australian university qualification. The response rate to the survey was 68 per cent. A large section of the major report, the *1998 Graduate Destination Survey*, records the destination of bachelor degree graduates for each participating institution.

The TAFE graduate destination survey

The TAFE GDS covers individuals whose usual address is in Australia and who completed a course leading to a specified award or qualification at a State- or Territory-funded TAFE institute in Australia.[2] The survey is a census of all graduates so defined, and graduates were asked to report on their activities at the end of May in the year following completion of their course. In 1998, there were close to 121 000 graduates within the scope of the survey, and the response rate to the questionnaire was 55 per cent.

The survey does not include graduates of recreational or hobby courses, nor graduates of private education and training provider courses. In addition, it does not include individuals who completed modules rather than courses, or graduates of courses that involved less than 200 contact hours or were less than one semester in duration. Since a large, and probably growing, proportion of TAFE graduates do not complete courses, the survey provides a partial indication of TAFE student vocational outcomes only.[3]

Graduates in the TAFE survey provided information on:

- their pre-course labour market and education activities
- course information, along with their motivation for undertaking it
- their labour market activities during and following their course

Graduates also provided information on any education and training qualifications that they held prior to undertaking their course and on any subsequent course participation. They were also asked to assess aspects of their course. In subsequent sections we will refer loosely to these assessments as the TAFE CEQ, though it is less detailed and has a different emphasis from the higher education CEQ and has not been analysed in the same way.

The TAFE graduate survey is undertaken by a consultant on behalf of NCVER. The TAFE authorities in each State and Territory provided mailing details on graduates and other course information to the consultant. The national report does not report the outcomes for individual institutions, though this information is analysed elsewhere.[4]

Comparing the outcomes data of the sectors

There are two separate issues in comparing the results published from the sectors' destination surveys. The first is the comparability of the data and the second is the way it is presented.

Broadly, the data collected by the questionnaires in each sector are quite comparable. Graduates are asked about their labour market and education activities some four to six months after completing their courses. If they are employed, graduates provide information about their hours of work, occupation, employer, wages or salary, and provide an indication of how long they have been in their jobs. If they are studying, they are asked to provide information on the level and field of the course, their type of attendance and the name of the institution where they are studying.

Graduates are asked about their labour market activities during the last year or semester of their course and whether they remain with the same employer. They are asked about employer support for their studies, along with other course attendance information.

Respondents provide information about their personal characteristics (age, sex, language background, whether they are of Aboriginal or Torres Strait Islander backgrounds and whether they have some form of disability). They also provide information on their highest pre-course education and training qualification.

The major difference between the two surveys is that, in a few critical areas, the TAFE survey requests additional information from graduates. The TAFE survey asks graduates about their labour market and education activities in the six months prior to their course, their reasons for undertaking their course and whether the course helped them achieve their objectives. Graduates also provide an assessment of whether they obtained some specified post-course benefits by completing their course.

These items are important for the measurement of the outcomes from the sector. The TAFE data allow pre- and post-course comparisons of the activities of individuals that the higher education data do not. The TAFE data allow individuals with vocational motivations for undertaking courses to be distinguished from those with personal interest motivations. Consequently, the TAFE sector graduate destination data allow a slightly more focussed assessment of course outcomes than do the higher education collection.[5]

In terms of the way the data are presented, the emphases of the two major published reports of the GDSs for the sectors are quite different. While broad national outcomes are reported in the higher education publication, the detailed comparisons in the report take the form of comparisons of the outcomes by differing fields of study and the outcomes of graduates from different institutions. Consequently, the report facilitates 'yardstick' competition between institutions, particularly in conjunction with the CEQ report. It provides considerable information for prospective students and their advisers.[6]

However, only a selection of the available data is utilised in the report. There is little analysis of the outcomes for different social groups, other than between males and females and younger and older graduates. There is no analysis of employer support of individuals undertaking higher education studies or of the outcomes of individuals with different pre-course education and training qualifications.

By contrast, the TAFE national publication contains no analysis of outcomes by institution, but places considerable emphasis on the outcomes of different client groups. Like the higher education publication, it contains field of study comparisons. The first survey of TAFE graduates was undertaken by the ABS and its report has provided the model for subsequent reports. That model involves some use of data from nearly all of the questions in the survey instrument. Consequently, the TAFE report has the flavour of an accountability instrument of government for the performance of an entire sector that it funds.

Both the GCCA and NCVER reports contain overview analyses of their results. These contain some historical comparisons and summaries of the key outcomes. While the precise categories

within labour market and the continuing education categories differ between the reports, the higher education categories can be reconciled broadly with the TAFE ones to allow comparisons of the outcomes of the sectors. It is to that task that we turn in section 4.2, following an attempt at comparing the sectors' outputs in section 4.1.

4 Overview of national outputs and outcomes

In this section we compare the output data from the VET and higher education sectors, to the extent that we can. We then describe the aggregate national employment, occupational, wage and education outcomes for graduates of the two sectors.

4.1 The sectors' outputs

Broad indicators of the outputs of the VET and higher education sectors are presented in table 1. The figures cover outputs as defined in the sectors' own terms and some figures that provide a better basis for comparison. In addition, table 1 includes some information on the distribution of enrolments by qualification level and field of study in each sector.

As indicated in section 3, the various output measures used by the sectors are not directly comparable. An enrolment in the VET sector means something different from one in higher education. Consequently, the VET enrolment numbers are much larger than the higher education ones. However, the course completion numbers on which the respective destination surveys are based indicate that more individuals completed higher education courses in 1997 than courses from TAFE institutions.

Data on student enrolments from the administrative collections are not easily reconciled with ABS data on student participation in education and training. The difficulties of reconciling the data are discussed in more detail in Burke (1995). Specifically, Burke notes that the ABS higher education participation estimates overstate those of the administrative collection, while those for the VET sector are less than half the administrative collection.[7] This difference partially reflects the difference between the 'point of time' ABS survey estimates for VET and the 'any time in the year' nature of the VET administrative collection. However, ABS surveys that mimic the TAFE collection's scope by identifying individuals enrolled in an education qualification at any time in a year show similar estimates to ABS point-of-time numbers. We present these data in the lower section of table 1.

The ABS data, taken from the education and training experience survey (ABS 1998a), indicate that more people participated in higher education courses in 1997 than in TAFE courses (711 000 compared with 462 000). Moreover, a much larger proportion of individuals participated in higher education on a full-year, full-time basis (54%) than in TAFE (22%) or other forms of education and training. A rough conversion of the ABS figures to full-time equivalent units suggests that the TAFE sector produced approximately half the output of the higher education sector.[8]

Also of note is that the number of completing graduates within the scope of the TAFE GDS is more compatible with ABS estimates than the enrolments from the VET administrative collections.

The figures in table 1 indicate that males make up the majority of VET students, while females outnumber males in higher education. The higher education student population is younger than the VET one. Bachelor degree enrolments dominate in the higher education sector, while the student population is more evenly distributed among VET qualification levels. The distribution of enrolments across fields of study is quite different between the sectors. The

most obvious differences lie in the higher share in humanities and science fields in the higher education sector, with a considerable share of TAFE enrolments (almost 20%) in multi-field education, which covers English as a second language, literacy and numeracy courses, along with pre-vocational/pre-employment courses.

Table 1: Outputs of higher education and VET sectors, 1998

Data from administrative collections	VET '000	Higher ed. '000
Number of course enrolments	1936.6	
Number of module enrolments	10706.1	
Number of module annual hours	312777	
Total number of enrolments	1535.2	671.9
EFTSU		524.1
Male enrolments (%)	51.5	45.3
Female enrolments (%)	48.5	54.7
Enrolments aged 24 years or less (%)	38.3	59.8
Enrolments aged 25 years or more (%)	61.7	40.2
1997 Course completions		155.1
1997 Course completions—Australian citizens/residents	120.8	130.2
Distribution of enrolments by qualification level	**Per cent**	**Per cent**
Endorsements & others	7.0	
Other certificates & statements of attainment	13.3	
AQF Senior secondary & Certificate I & II	18.4	
AQF Certificate III & equivalent	22.8	
AQF Certificate IV & equivalent	9.5	
Diplomas	11.5	
Enabling, non-award and cross-institution	17.5	1.5
Other undergraduate		2.1
Bachelors degree		76.0
Other post-graduate		7.2
Higher degree – coursework		7.8
Higher degree – research		5.3
Distribution of enrolments in each field of study[a]		
01 Land and marine resources, animal husbandry	5.9	1.8
02 Architecture, building	5.0	2.3
03 Arts, humanities and social sciences	6.9	24.7
04 Business, administration, economics	31.1	25.6
05 Education	2.4	11.0
06 Engineering, surveying	13.6	7.5
07 Health, community services	8.5	11.6
08 Law, legal studies	0.6	4.8
09 Science	7.0	15.9
10 Veterinary science, animal care	0.2	0.3
12 TAFE multi-field education	18.8	

Table 1: Outputs of higher education and VET sectors, 1998 (cont.)

ABS survey data	TAFE '000	Other [b] '000	Higher ed. '000
Enrolments for an education qualification in 1997			
Full academic year			
Full-time enrolments	103.4	29.5	384.4
Part-time enrolments	212.2	47.0	149.6
External	36.4	35.8	102.9
Part of an academic year			
Complete semester	90.2	46.4	67
Less than one semester	19.5	6.0	7.4
Total	**461.7**	**164.7**	**711.3**

Note:

(a) The VET publication includes a 'services, hospitality, transportation' category. In the higher education publication, these fields are included in the business category. We follow the higher education classification in this table

(b) Includes business colleges, adult and community education, professional or industry associations, private training organisations, SkillShare centres, secondary schools and the like

AQF: Australian Qualifications Framework

Source: NCVER (1999); DETYA (1998b); ABS (1998a)

This brief sketch provides a reasonable indication of the size of the sectors and the inadequacies of present administrative collections for comparing the outputs of the sectors. We turn now to comparisons of the outcomes of the sectors, where the data provide a much sounder basis for comparison.

4.2 The sectors' employment and education outcomes

Broad employment and education outcomes by qualification level are presented in table 2 for the higher education and TAFE sectors. These figures were drawn from the respective GDSs of the two sectors. In addition, the bottom section of the table contains information from the ABS survey of employment and unemployment patterns (SEUP), (ABS 1998c). This information is discussed below.

Employment outcomes

Our discussion of the results utilises simple proportions of graduates who undertake particular post-course activities. However, the GCCA publication uses a more complicated formulation. It separates the graduate population into those 'available for full-time work' and those who are not. Those 'available' include those actually working full time and anyone else looking for full-time work. Those 'not available' for full-time employment include those studying full time and anyone else not seeking full-time work.

This classification seems somewhat problematic. In the first place, some eight per cent of Bachelor graduates studying full time and treated as not available for full-time work reported themselves as actually employed full time in 1998 (GCCA 1999a: figure 2, p.18). A further nine per cent indicated they were seeking full-time work, suggesting that there is a 'hidden' full-time labour force component of the 'not available' categorisation. Andrews and Wu (1998) reported that the proportion of graduates in full-time study increased with the full-time unemployment rate. They found that each one percentage point increase in the aggregate full-time unemployment rate led to a 1.3 percentage point increase in the proportion of Bachelor

graduates undertaking further full-time studies. Because of such analyses, the recent GCCA publication indicated that in the future a brief alternative analysis of the data would also be presented. Given these doubts about the 'available/not available' categorisation, we use the simpler approach of reporting those graduates actually undertaking any activity. This information is comparable to the data available from the TAFE destinations publication.

Overall, a higher proportion of higher education graduates worked full time following their course than TAFE graduates (58% compared to 51%). The first three columns of the top section of table 2 show the proportion of graduates employed full time, part time and total employment following the completion of their course for each qualification level. In the higher education sector, post-graduate level courses had higher full-time employment outcomes than did Bachelor degrees. In the TAFE sector, higher level courses also tended to have higher full-time employment outcomes, particularly compared with some of the lower level certificate courses.

More TAFE graduates worked part time following their course than higher education graduates (23% compared with 13%), though part of this difference reflects some differences in data definitions. The TAFE part-time work figures include all part-time workers, while the higher education figures exclude anyone studying full time and working part time. A calculation reported at the bottom of table 2 suggests that if half the TAFE graduates studying and working part time following their course were full-time students, the comparable calculation to the higher education number would be that 16 per cent of TAFE graduates worked part time.[9]

The qualifications that stand out in terms of part-time employment outcomes are the trade-related VET qualifications. Very few graduates of trade-related certificates worked part time following completion of their course.

The total employment outcomes of the two sectors are quite similar, with over 70 per cent of graduates of both sectors employed following completion of their courses. The employment outcomes were highest for doctorate graduates and those who completed trade-related qualifications in the VET sector.

Of course, many individuals undertake courses and remain with their employers throughout the duration of the course. This occurs in the VET sector and among those undertaking post-graduate qualifications in the higher education sector.[10]

The employment status of individuals prior to studying has a significant impact on their post-course outcomes. The importance of individuals' pre-course activity in determining their post-course outcomes is readily shown from the TAFE data. In figure 1, we present the major destinations of TAFE graduates according to their pre-course activity. Over 80 per cent of graduates employed full time prior to their course were employed full time after it. Of the other pre-course activities, about 40 per cent of those employed part time, unemployed or not in the labour force before their course remained in the same state after it. Roughly 40, 30 and 20 per cent, respectively, of individuals in those three pre-course activities found full-time work following completion of their courses. The better post-course outcomes for those who were previously employed full time reflects both continuing employment relationships and demonstrated work skills.

When the overall data are adjusted to exclude those in long-term employment relationships, a slightly different picture emerges. In the fourth column of table 2, we adjust the estimated total employment rates to try to account for those individuals who remained with their employers throughout their course. These rates are presented in figure 2 as deviations from the overall TAFE average. For the VET sector, the adjustment involves excluding all of those individuals employed by the same employer before, during and after their courses. When those individuals are excluded, the overall employment rate drops from 73 to 59 per cent for TAFE graduates, though the broad pattern by qualification level is unchanged with trade-related qualifications continuing to have the highest employment rates.

The same adjustment cannot be made for the higher education data since pre-course employment information is not collected. However, we can exclude some workers in substantial full-time work relationships. The GCCA publication identifies Bachelor-level graduates who were employed full time by their post-course employer early in the final year of their course (before May). If these individuals are excluded from the employment rate calculation, it falls from 68 to 59 per cent for Bachelor graduates, almost the same as the overall TAFE figure.

In one sense, this comparison favours the TAFE sector since the adjustment for Bachelors would exclude more individuals if applied to the TAFE sector than the adjustment actually used there. However, the higher education adjustment applies only to full-time workers and ignores any post-course part-time workers who remain with their pre-course employers.

Consequently, the conclusion that the overall employment outcomes of individuals studying in the sectors are similar appears reasonable. However, there are differences between qualifications in both sectors, with higher level courses tending to have better employment outcomes. Higher education qualifications also appear to have higher full-time employment outcomes than do most VET courses.

Table 2: Employment and education outcomes by qualification level

	Employment outcomes			Education outcomes		
	Working full time %	Working part time[a] %	**Total employment rate %**	Adjusted employment rate[b] %	Studying full time %	Studying %
Doctorate	77.1	13.2	**90.3**		2.6	
Masters research	63.8	15.8	**79.5**		12.1	
Masters other	77.0	10.6	**87.7**		4.8	
G/PG diploma	64.3	18.9	**83.2**		7.8	
Graduate certificate	73.6	13.6	**87.2**		5.8	
Graduate Bachelor	61.0	22.4	**83.4**		6.2	
Honours Bachelor	50.1	12.1	**62.2**		28.7	
Pass Bachelor	53.7	14.7	**68.5**		21.5	
3-year UG diploma	56.4	17.2	**73.6**		16.8	
Total Bachelors	53.4	14.6	**68.0**	59.3	22.1	
Total higher education	**58.2**	**12.9**	**71.1**		**17.6**	**26.5**
Diploma	47.4	31.5	**78.9**	71.3		29.7
Associate diploma	59.6	22.8	**82.4**	73.6		33.3
Advanced cert. – post-trade	79.1	8.4	**87.6**	76.2		46.7
Advanced cert. – other	58.7	21.9	**80.7**	65.2		34.4
Certificate – trade	89.3	3.6	**92.9**	88.7		21.7
Certificate – other	45.1	24.3	**69.4**	51.7		37.2
AQF Advanced diploma	48.6	22.7	**71.3**	61.7		44.1
AQF Diploma	46.8	29.7	**76.5**	64.5		37.8
AQF Cert. IV	54.3	24.5	**78.8**	55.6		47.3
AQF Cert. III	44.3	27.1	**71.5**	55.1		40.1
AQF Cert. II	32.2	24.1	**56.3**	41.2		44.6
AQF Cert. I	37.4	20.9	**58.3**	46.9		46.6
Total TAFE	**50.8**	**22.6**	**73.4**	**58.6**	[c]**10.9**	**38.5**

Table 2: Employment and education outcomes by qualification level (cont.)

	Employment outcomes			Education outcomes		
	Working full time %	Working part time[a] %	**Total employment rate %**	Adjusted employment rate[b] %	Studying full time %	Studying %
ABS SEUP						
Total job seekers	32.2	19.6		51.7		
Early school leaver				44.6		
Long-term unemployed				33.5		
Speaks English—fairly well				41.7		
Speaks English—not well/not at all				25.8		

Notes:

(a) The higher education part-time work figures do not include anyone studying full time and working part time. The TAFE part-time proportion includes anyone working part time. Hence, they include those studying full time and working part time. Close to 43 per cent of TAFE graduates working part time were studying. If half of these were working full time, the comparable total TAFE figure to the higher education total would be 16.1 per cent. The TAFE calculations exclude those who indicated that they were working, but did not indicate whether they were working full time or part time

(b) The adjusted rates were calculated as follows: for TAFE, all individuals working with the same employer before, during and after their course were excluded from the calculations; for higher education, those working full time before May of their final year with their full-time post-course employer were excluded from the full-time calculations. The part-time rates for higher education were not adjusted for those continuing with the same employer since these people are not identified in the GCCA publication

(c) The full-time study estimate for TAFE was calculated as including those students undertaking more than 20 hours per week at the institution they attend, plus any students attending a university and undertaking 11–20 hours

SEUP: Survey of employment and unemployment patterns

Source: NCVER (1998); GCCA (1999a); ABS (1998c)

Employment outcomes in the broader population

A natural question to ask is: what would the employment outcomes of these students have been if they had chosen not to undertake their course? While we cannot answer that for specific students, we can analyse the employment outcomes of others who looked for work over the same period the students were undertaking their courses. The SEUP by the ABS (1998c) allows us to look at this issue.

The SEUP was a longitudinal study of job seekers that tracked their labour market activities over a number of years. The job seekers were individuals aged 15 to 59 years who, in May 1995, were unemployed, discouraged or underemployed workers, or persons not in the labour force who wanted work but did not meet all of the ABS' criteria to be classified as being unemployed. In the bottom section of table 2 we set out the employment outcomes for these job seekers in September 1997.

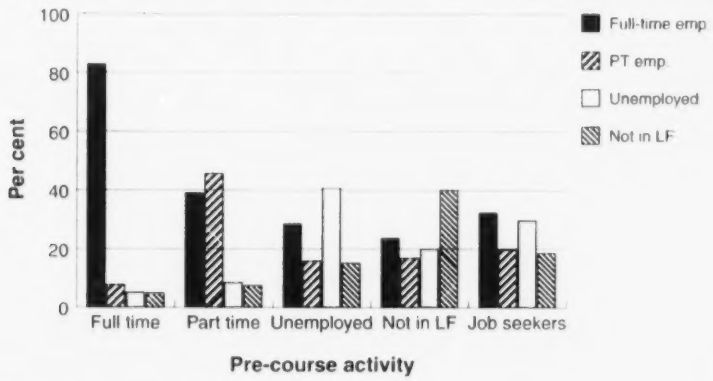
These figures provide a reasonable, though imperfect, comparison group for the employment outcomes of the higher education and VET sectors. The ABS data reflect the experience of job seekers in the wider labour market in obtaining employment over a 28-month period, one that roughly coincides with the studies of the students in the destination surveys. The median and mean lengths of courses undertaken by TAFE graduates were 11 and 19 months respectively. The median time between course completion and the survey data was six months and the mean close to eight months. Hence, a 'typical' TAFE graduate began a course some 17 to 27 months before their employment status was observed at the end of May 1998. For higher

education graduates, their course of study typically commenced around three-and-a-half years earlier than their outcomes were observed since Bachelor graduates dominate the higher education series.

If individuals can be thought of as choosing between (i) a course of study or (ii) pursuing a job through immediate job search that continues until a job is found, then the ABS data provide some indication of the success of the latter strategy, while the course employment outcomes provide an indication of the success of the first strategy.

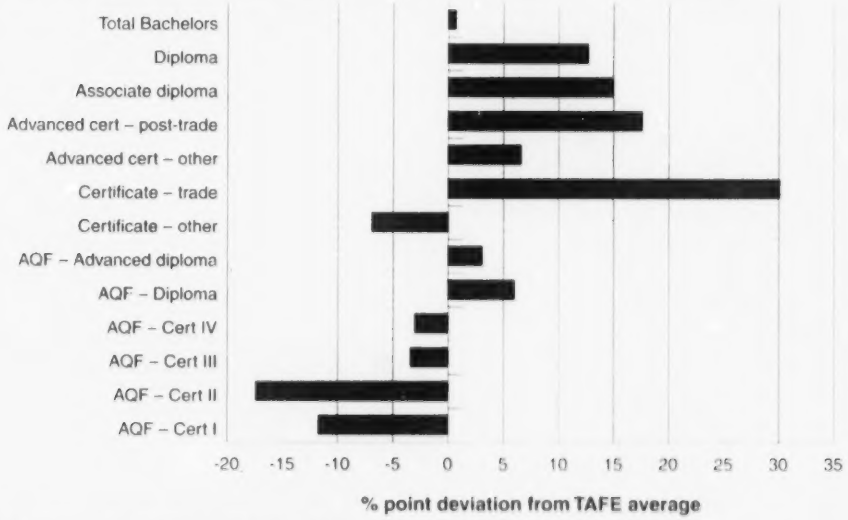
Of course, comparing the outcomes of the two strategies at a time just following the conclusion of the courses provides an in-built bias against the education and training outcomes. Individuals who engaged in job search had more than two years to secure a job, while those who undertook courses may have postponed that activity. In fact TAFE students did both. While the number of TAFE graduates employed after their course was 10 388 higher than the number employed prior to it, 40 per cent of this increase took place prior to, or during, the students' last semester. Consequently, the job seeker outcomes provide a good basis for identifying the outcomes of an alternative that was open to those who undertook education and training courses and completed them in 1997.

Figure 1: TAFE labour market destinations by pre-course labour market activity



Source: NCVER (1998); ABS (1998c)

Figure 2: Adjusted total employment outcomes by qualification level



Source: NCVER 1998; GCCA (1999a)

The results from the ABS survey suggest that just over half the 1995 job seekers were working in 1997. However, those from more disadvantaged groups—for example, the long-term unemployed, those whose English was not good or who had low levels of education—had considerably lower employment outcomes.

The dynamics of the employment rate in the ABS data is worth noting. The proportion of employed 1995 job seekers grew quite quickly initially, reaching 45 per cent by May 1996, but then the growth tapered off substantially, increasing by only three percentage points between September 1996 and September 1997, from 48.2 to 51.7 per cent. Hence, the employment rate observed by September 1997 is probably also a reasonable basis for comparing the employment outcomes of courses that are longer than two years.

When we compare the job seeker outcomes with the adjusted employment outcomes for the various qualifications in the graduate destinations data, we find that the employment outcomes of most qualifications exceed that of the overall ABS job seeker group. The employment outcomes for all qualification levels exceed those of the most disadvantaged in the ABS survey.

However, the employment outcomes for the job seeker group in the ABS data were quite similar to those TAFE graduates who were unemployed before their course, and somewhat better than those who were not in the labour force. We present this comparison in the analysis of pre- and post-course activities of TAFE graduates in figure 1. In terms of simply obtaining a job then, participation in a TAFE course did not appear to improve substantially the job prospects of some individuals. It is clear from analysis in section 4.3, however, that SEUP job seekers entered much lower skilled occupations than TAFE graduates.

Education and training outcomes

The right-hand columns of table 2 show the proportion of graduates who studied in the year following completion of their earlier course. Almost four in ten TAFE graduates (39%) and one-quarter of higher education graduates undertook a further course in 1998.

The patterns of participation were quite different, however. Two-thirds of the higher education graduates studying undertook their course full time, while only about a quarter of the TAFE graduates did their subsequent course full time. In both sectors, the continuation rates tended to be highest among graduates whose earlier qualification was a lower level qualification (a Bachelor-level qualification in the higher education sector and a certificate in the VET sector).

Similar percentages of graduates expressed satisfaction about the overall quality of the course they undertook. On a ten-point scale, 68 per cent of TAFE graduates assessed the overall quality of their course with a score of eight or above (classified as 'good' in NCVER 1998, p.36). Among Bachelor degree graduates, 67 per cent agreed or strongly agreed that they were satisfied with the quality of their course (GCCA 1999d).

4.3 Graduate occupations

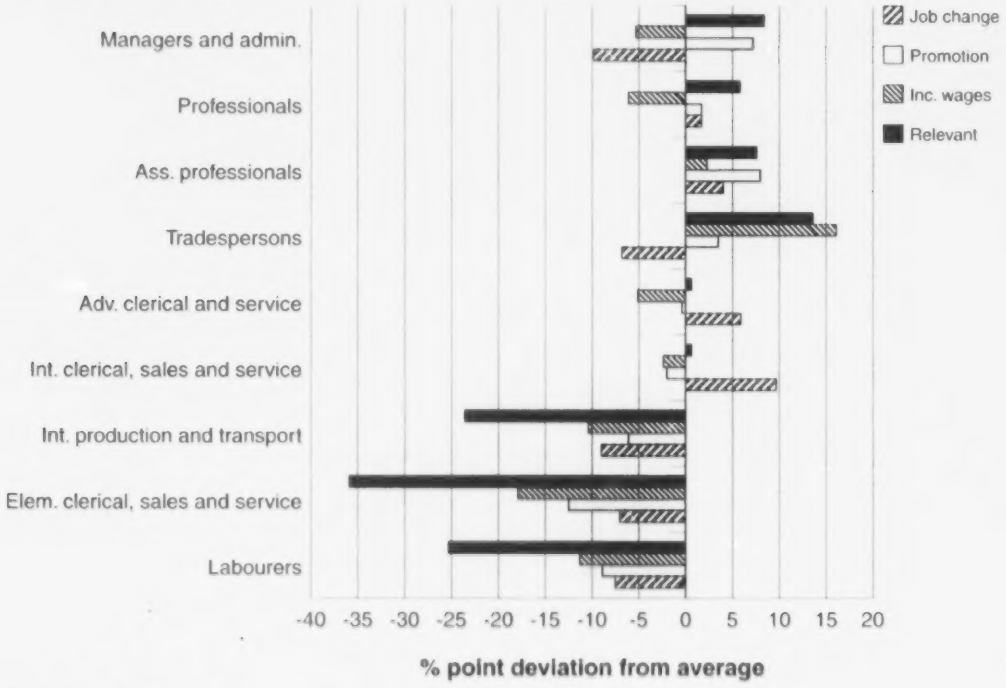
A key step for graduates in their careers is obtaining a suitable job following completion of their course. In this section, we analyse how the occupations of higher education and TAFE sector graduates differ.

Finding employment in the 'right' occupations is important for graduates of both sectors. Andrews and Wu (1998) analysed the extent to which Bachelor degree graduates found work increasingly outside traditional occupations over the course of the 1990s. One consequence of this widening of graduate occupational destinations was to lower graduate starting salaries relative to the rest of the workforce.

Relevance of courses to jobs

From the graduates' perspectives, completion of their course provided greater benefits in more highly skilled occupations where the skills, knowledge or attributes acquired through their courses were more relevant than in lower skilled jobs. In figure 3, we present TAFE graduates' responses by occupation on the relevance of their course to their job and on the wage and job benefits they perceived they enjoyed from having completed their course. We centre these responses on their average for each variable.[11] Graduates working in occupations in the top half of the figure (the more skilled ones) are clearly more likely to report receiving benefits from completing their course than are graduates working in lower skill occupations. This demonstrates that the occupations of the jobs obtained by graduates are an important dimension of the employment outcomes of education and training courses.

Figure 3: Relevance of course to job and work-related benefits from undertaking it by occupation—TAFE graduates



Source: NCVER (1998)

Occupations of graduates

We show the occupations where graduates of the two sectors find jobs in tables 3a, 3b and 3c. Table 3a contains the occupations where higher education graduates worked in 1998. Tables 3b and 3c present the occupations where different groups of TAFE graduates worked.

The occupational classifications used for the two sectors differ slightly. The GCCA publication (mostly) uses the ABS Australian Standard Classification of Occupations (ASCO) First Edition to classify occupations. The TAFE publication uses the Second Edition of ASCO. These differences between the classifications are not of great significance for our analysis since the occupational distributions of the graduates of the two sectors are fundamentally different.

Full-time workers

Two-thirds of higher education graduates employed full time worked as professionals, and a further 15–20 per cent worked as managers or as para-professionals. By contrast, TAFE graduates were more evenly distributed across occupations: just ten per cent of TAFE graduates worked as professionals, while one-third of them worked as tradespersons.

Part-time workers

The distribution of graduates who worked part time also differed considerably between the sectors. Once more, a large proportion of higher education graduates worked as professionals (close to one-half), with most of the remainder working as sales and personal service workers. Among TAFE graduates, the majority of part-time workers were in the intermediate or elementary clerical, sales and service worker categories. Few tradespersons worked part time.

Skill index

In order to compare these distributions with the rest of the workforce we make use of an occupationally based skill index developed in Bureau of Labour Market Research (1987) and used in the Department of Employment, Education and Training (DEET 1991). In those publications, the skill index was calculated for the occupational classifications then in use by the ABS. In appendix 1, we calculate the index at the sub-major group level for the Second Edition of ASCO, using the 1996 Census.

The index provides a ranking of occupations according to qualifications held by individuals who work in those occupations. To the extent that qualifications impart skills, the index gives a broad measure of the skills of individuals who work in an occupation relative to other occupations. The index is centred on zero and the score for any occupation can be converted to an estimate of the proportion of jobs in the economy that are less skilled than that occupation. We can also use these occupational scores, weighted by the distribution of graduates across occupations, to estimate the average skill levels of jobs that graduates of some particular qualification obtain. For example, a score for the index of zero for some group means that half the jobs in the economy are less skilled than the typical job filled by a member of that group. We also report these estimates for different groups of graduates in tables 3a, 3b and 3c, based on the occupational scores that appear in the last column of table 3a.

The results confirm that higher education graduates enter much more skilled occupations than do TAFE graduates. The 'typical' job of a Bachelor degree graduate who worked full time was more skilled than 86 per cent of jobs in the economy. In contrast, the typical job of TAFE graduates who worked full time was close to the average skill level of jobs in the economy. For both groups, those who worked full time tended to enter higher skilled occupations than those who worked part time.[12]

Table 3b presents the occupational distributions of graduates from a subset of VET qualifications. The results are representative of other courses in the sense that graduates from low-level certificates tended to be employed in lower skilled jobs, while graduates from higher level qualifications were employed in higher skilled ones.

Occupational outcomes for important TAFE student groups

In table 3c, we present the occupational distributions of some key groups of TAFE graduates, notably those employed after, but not before, their courses, those in their first full-time job following their course (these groups overlap), and those employed both before and after their course. These groups all capture important elements of the employment outcomes of the VET courses: participation provides a bridge to employment in the first two cases, and the opportunity to obtain a better job in the third case.

Not surprisingly, those not employed before their course and/or working in their first full-time job obtained slightly lower skilled jobs than those filled by all TAFE graduates. However, the difference is quite small. Those who worked before their course managed to move into more-skilled jobs following it. Partly, this reflects the movement of part-time workers into full-time jobs, but it also reflects movement of graduates into more-skilled occupations following completion of their courses.

Occupations of job seekers from the SEUP

We can also compare these occupational distributions with the occupations obtained by job seekers in the ABS' SEUP study. These also appear in table 3c. Just over 60 per cent of that group worked full time in September 1997, a similar proportion to those TAFE graduates employed after their course who were not employed before it.

Job seekers were employed in demonstrably lower skilled occupations than TAFE graduates, with the distribution of their jobs being more like that of the TAFE part-time worker distribution. At the same time, less than half the job seekers were in permanent employment (48.7%), compared with 57 per cent of those TAFE graduates employed after their course who were not employed before it.

Table 3a: Occupational outcomes of graduates—higher education

	All graduates			Bachelor graduates[(a)]	Skill Index Weight
	Full time	Part time	**Total**	Full time	
Managers & administrators	6.4	2.1	**5.5**	6.1	0.754
Professional	67.4	47.2	**63.2**	66.5	1.484
Para-professional	13.0	10.0	**12.4**	12.8	0.365
Tradespersons	0.2	0.3	**0.2**	0.2	0.377
Clerical workers	6.9	7.7	**7.1**	5.8	-0.282
Salespersons & personal service workers	5.0	29.8	**10.1**	5.9	-0.219
Plant & machine operators	1.0	2.9	**1.4**	1.7	-0.790
Labourers	–	–	–	1.0	-1.648
Skill index	1.06	0.64	**0.97**	1.02	
Proportion of jobs less skilled	0.86	0.74	**0.83**	0.85	

Note:

(a) For Bachelor graduates, only the category of clerical/sales/service was identified. This category was split between clerical and sales and personal service workers, which seems not unreasonable given the full-time, total graduates split. Given that the two categories attract similar weights, this split is of very little consequence

Source: GCCA (1999a): see appendix 1 for the derivation of the Skill Index

Table 3b: Occupational outcomes of graduates—TAFE—total and representative qualifications

	All graduates			Assoc. dip.	Cert. – trade	AQF Cert. IV	AQF Cert. II	Skill Index Weight
	Full time	Part time	Total					
Managers & administrators	4.5	1.3	**3.6**	3.8	1.1	7.1	1.9	0.754
Professionals	10.6	10.4	**10.5**	14.4	1.0	24.2	6.9	1.484
Associate professionals	15.6	8.3	**13.4**	27.1	3.6	17.9	8.4	0.365
Tradespersons	32.8	5.6	**24.6**	9.7	84.9	8.9	15.5	0.377
Advanced clerical & service	4.6	4.6	**4.5**	4.4	0.1	4.2	6.1	-0.282
Intermediate clerical, sales & service	19.4	38.0	**25.0**	26.6	1.4	23.9	29.4	-0.219
Intermediate production & transport	3.7	3.5	**3.6**	2.6	2.3	3.4	5.5	-0.790
Elementary clerical, sales & service	4.0	19.4	**8.5**	7.4	1.2	7.0	14.1	-1.194
Labourers & related workers	4.9	9.0	**6.2**	4.1	4.4	3.3	12.1	-1.648
Skill index	0.16	-0.29	**0.02**	0.13	0.25	0.28	-0.29	
Proportion of jobs less skilled	0.56	0.39	**0.51**	0.55	0.60	0.61	0.39	

Source: NCVER (1998): see appendix 1 for the derivation of the Skill Index

Table 3c: Occupational outcomes of graduates—TAFE—key transition groups

	Not employed before course		ABS SEUP	First full-time job	Graduates employed both before and after course	
	Employed after				Pre-course	Post-course
	Full time	*Part time*				
Managers & administrators	1.3	0.6	2.0	1.6	3.6	4.1
Professionals	5.7	8.5	9.6	5.3	9.2	11.0
Associate professionals	10.8	5.9	6.2	10.3	10.8	13.9
Tradespersons	43.3	5.4	12.3	47.0	17.3	22.7
Advanced clerical & service	4.4	4.2	2.5	3.7	4.1	4.4
Intermediate clerical, sales & service	20.4	42.3	21.3	19.2	22.6	22.7
Intermediate production & transport	3.2	4.0	13.1	2.9	5.5	3.5
Elementary clerical, sales & service	4.7	18.6	12.2	5.0	14.9	7.8
Labourers & related workers	6.3	10.6	20.7	5.0	11.4	5.4
Skill index	0.06	-0.36	-0.42	0.09	-0.20	0.06
Proportion of jobs less skilled	0.52	0.36	0.34	0.53	0.42	0.52

Source: NCVER (1998); ABS (1998c): see appendix 1 for the derivation of the Skill Index

4.4 Graduate wages

The starting salary or wages received by graduates represent another widely used dimension of the outcomes of education and training. The GCCA publishes a separate analysis of higher education graduate starting salaries (GCCA 1999b), while the TAFE graduate destination includes information about the wages of graduates. The GCCA's comparison of the starting salaries of new higher education graduates aged less than 25 with average weekly earnings

(AWE) shows a long decline in relative starting salaries from the late 1980s. In 1998, the median salary of new Bachelor graduates aged less than 25 was 80.6 per cent of AWE.

However, there are a number of problems with these types of comparisons. In the first place, starting salaries may be unreliable predictors of subsequent earnings growth. Some occupations that provide low starting salaries may do so because the early years of employment in those occupations involve considerable on-the-job training, which individuals partially pay for through lower wages.

More significantly, comparing graduates' starting salaries with AWE involves a comparison of dissimilar groups (young graduates versus the entire workforce) in different jobs (graduates are primarily in professional jobs and are compared against those in all jobs).[13] At any one time, their age works substantially against graduates in this comparison, while the occupational distribution works in their favour.

Over time, however, it is likely that compositional changes have lowered the measured relativity since both the ageing of the work force and the increased share of jobs accounted for by professionals would have acted to increase the reported AWE. At the same time, the move into non-traditional, lower paid occupations by graduates would have lowered the numerator. Andrews and Wu (1998) attribute about a third of the decline in relative starting salaries between 1989 and 1997 to the broadening of Bachelor graduate destinations.

The GCCA does compare Bachelor graduates' starting salaries with the earnings (converted to annual salaries) of those aged 20–24 years. In 1998, new Bachelor graduates aged less than 25 years earned 15.4 per cent more than the median 20–24-year-old salary of $26 000. In contrast, TAFE graduates in their first full-time job earned (annualised) $24 440, or six per cent less than the median salary of 20–24-year olds.

The wages of TAFE graduates working full time

We look initially at the wages of two groups of TAFE graduates. The first consists of all graduates working in their first full-time job. The second group consists of the remaining group of full-time workers.[14] In the first two columns of table 4a, we compare the average weekly wages of TAFE graduates from these groups in different occupations with the full-time AWE in that occupation.[15] The comparisons involve dividing the TAFE graduates' wages in each occupation with the full-time occupational AWE. Values of less than one imply that TAFE graduates typically received less than the average wage in that occupation.[16]

The first column provides the comparison of the wages of TAFE graduates in their first full-time job with full-time AWE for each occupation. These graduates typically earn around 75 per cent of AWE across occupations. The total figure was just two-thirds (0.67), however, which reflects the differences in the distribution of TAFE graduates in their first full-time jobs across occupations compared with the total workforce. In the overall distribution of full-time workers, about 40 per cent of the distribution is in the top three occupations. Less than 20 per cent of the TAFE graduates in their first full-time job were in those occupations. These compositional differences drive down the average wage across all occupations for the TAFE graduates compared with aggregate AWE.[17]

The second column of table 4a contains the wages of other TAFE graduates employed full time relative to occupational AWE. These figures are considerably higher than the previous set, with average TAFE graduate wages being higher in some occupations than AWE. Again, there is some evidence of a compositional effect with the total figure appearing 'low'.

Comparisons with age-adjusted AWE

We now consider comparisons where we adjust the AWE figures so that they reflect the age distribution of TAFE graduates, rather than being measured over all age ranges. In the first column of the lower panel of table 4a, the denominator in the comparison is just the aged 20–24-years occupational wage. These estimates suggest that TAFE graduates in their first full-

time jobs in highly skilled occupations are remunerated relatively well (above the occupational AWEs), while those in lower skilled occupations are paid relatively less well. In the second column, we weight the occupational AWEs by the age distribution of TAFE graduates in their first full-time jobs. These results show a similar pattern to those of the previous column.

In the next column of table 4a, we compare full-time employed TAFE graduates who are not in their first full-time job with weighted occupational AWEs, with the weighting reflecting TAFE graduates' age distribution. While the results show no obvious pattern, what is notable is that the tradespersons relativity is so low. Since this is the largest occupational grouping, with one-quarter of the TAFE group, this holds down overall relative wages. This may simply reflect age differences among TAFE graduates between those employed as tradespersons and other graduates. The average age of TAFE graduates in the survey was 31 years. However, the average age of those graduates who completed a trade certificate was 24 years. Graduates from this qualification made up about half of those employed as tradespersons. Since this difference is substantial, it seems likely that a considerable part of the difference in observed wage relativities reflects in the relative ages of respondents in occupations.

The final column in table 4a provides the average occupational wage for TAFE graduates in their first full-time job. These wage numbers have been the numerators in three of the earlier columns of this table. We now use them for another purpose.

Wages by qualification level

In table 4b, we present the salaries or wages paid to graduates with different qualification levels working in their first full-time jobs. The median salaries of higher education post-graduates have been converted to weekly equivalents, as have those for Bachelor graduates. The median salaries of higher education post-graduates are not directly comparable to the other figures since they cover graduates of any age and are not restricted to those in their first full-time job. The wage estimates clearly show that those with higher level education and training qualifications tend to be paid more than those with lower level ones in both sectors.

In the lower section of table 4b, we compare average wages since these are the figures presented in the TAFE publication. The mean salary for all higher education graduates working full time is taken from the GCCA publication (GCCA 1999a, p.34). We use this to estimate the mean graduate salary for Bachelors who worked full time in their first job as in the range $32 000 to $33 000 (their median salary plus $2000 to $3000), which provides a weekly equivalent of $615 to $635. This wage range is above all but one of the average wages for VET qualifications. Hence, Bachelor graduates typically are paid more than TAFE graduates are in their first full-time jobs.

Predicted wages by qualification level

We have previously noted that Bachelor graduates are employed in quite different occupations from TAFE graduates. The question we now consider is whether the difference in their initial wages reflects real differences in the way they are remunerated, or just the difference in the occupations in which the two groups are employed.

The second column in the lower half of table 4b contains the average wage we would observe for each qualification if graduates received the average occupational wage paid to TAFE graduates in their first full-time job. That is, we take the average occupational wages in the last column of table 4a and multiply them by the distribution of graduates employed full time in their first full-time job across occupations for each qualification level.[18] The resulting predicted wages show how graduates from each qualification level would be paid if they received the TAFE occupational average wage.

Table 4a: Wage outcomes by occupation and qualification—TAFE

	Share of occupational AWE	
	First full time	Other full time
Managers and administrators	0.666	0.854
Professionals	0.724	0.895
Associate professionals	0.780	0.937
Tradespersons	0.710	0.900
Advanced clerical and service	0.752	1.007
Intermediate clerical, sales and service	0.758	0.923
Intermediate production and transport	0.774	1.031
Elementary clerical, sales and service	0.755	0.986
Labourers and related workers	0.802	1.029
Total	**0.670**	**0.904**

		Age adjusted AWE		First full time
	First full time/aged 20-24 AWE	First full time	Other full time	Wages
Managers and administrators	1.071	1.221	1.021	703
Professionals	1.048	1.117	0.989	639
Associate professionals	1.061	1.107	1.003	588
Tradespersons	0.872	0.921	0.890	445
Advanced clerical and service	0.902	0.956	1.025	444
Intermediate clerical, sales and service	0.928	0.949	0.943	444
Intermediate production and transport	0.885	0.951	1.060	508
Elementary clerical, sales and service	0.868	0.896	0.975	393
Labourers and related workers	0.830	0.908	1.020	417
Total	**0.902**	**0.943**	**0.964**	**470**

We can then compare these predicted wages with those actually observed for graduates of a specific qualification to determine the extent to which graduates were remunerated more or less generously than average. Departures from the predicted wage presumably reflect employer valuations about the productivity of different groups of workers, though we are not able to identify the specific contribution of the qualification individuals actually completed to their wages.

The comparison suggests that departures from average remuneration are considerable. Graduates of lower level certificate courses were paid significantly below the average rates paid to TAFE graduates. In contrast, graduates of higher level qualifications—for example, advanced certificates, AQF Certificate IV and associate diploma graduates—earned substantially more.

What is of interest in comparing the remuneration of graduates of the different sectors is that young Bachelor degree graduates earned only slightly more than the predicted value, given their distribution across occupations. This suggests that, at least in their first year after completing their course, young Bachelor graduates working full time are not paid substantially more than TAFE graduates where they work in the same occupations.

This is not to say that employers value or estimate the productivity of the two groups of workers as being equal. Bachelor degree graduates may well be investing relatively more in on-the-job training early in their careers, trading off wages for training, and thereby

Table 4b: Wage outcomes by occupation and qualification—starting salary/wages by qualification level

	Actual	Predicted	Difference
	$	$	%
Median salaries/52			
PhD	887		
Masters research	923		
Masters coursework	962		
Other post-graduate	808		
Bachelors degree	577		
All higher education graduates	615		
Average wages			
All higher education graduates	670		
Bachelors degree	615 to 635	609	1.1 to 4.3
Diploma	521	490	6.0
Associate diploma	558	505	9.5
Advanced cert. – post-trade	634	473	25.4
Advanced cert. – other	592	497	16.0
Certificate – trade	483	449	7.0
Certificate – other	407	471	-15.8
AQF Advanced diploma	523	500	4.5
AQF Diploma	517	498	3.6
AQF Cert. IV	600	514	14.3
AQF Cert. III	439	465	-5.9
AQF Cert. II	380	462	-21.5
AQF Cert. I	319	449	-40.9
Total TAFE	**470**	**470**	**0**
ABS SEUP[a]	366	369	-0.8

Note:

(a) The SEUP 'actual' figure is the median wage for employed job seekers. The 'predicted' wage used TAFE occupational wages calculated as weighted averages of the first full-time and total part-time wages for persons. The weights reflected the proportions working full and part time of those employed after, but not before, their courses. A similar proportion of these TAFE graduates were working full time (62%) as in the SEUP (61%)

Source: NCVER (1998); GCCA (1999a; 1999b); ABS (1998c) and unpublished data from ABS (1998b)

generating faster subsequent earnings growth.[19] It may also be the case that the apparent success of some TAFE graduates in obtaining work in highly paid occupations reflects their success in 'niche' segments within those broader occupational groups. For example, they may be concentrated among computing professionals rather than being distributed across the professions like Bachelor graduates.

We use a similar approach to assess the remuneration received by the job seeker group in the ABS SEUP study. We derive TAFE graduate-based occupational wages from the first full-time AWE estimates and part-time wages for persons, with weights reflecting the employment of TAFE graduates employed after, but not before, their courses. When we multiply these wages by the job seeker occupational distribution, the predicted wage is very close to the actual median wage for job seekers. Hence, it seems likely that job seekers are also remunerated in a similar manner to TAFE graduates where they work in similar occupations with similar hours of work.[20]

5 Outcomes for different courses and social groups

In this section, we break down some of the national outcomes we discussed in section 4 for specific groups and different courses within the sectors. Our purpose in doing this is to determine whether those national outcomes are representative of the experiences of different groups and individuals who complete different qualifications.

5.1 Outcomes for different courses

We begin by presenting the employment rates of graduates in different fields of study at different qualification levels. We do this in tables 5 and 6. Results for Bachelor-level courses are the only results published for the higher education sector. While the rates can be estimated for all level courses in the VET sector, we suppress results where they would be based on a small number of graduates (less than 50 individuals). In table 5, the unadjusted rates are presented, similar to those of the third column in table 2. In table 6, we make the same adjustment to the employment rates as those of the fourth column of table 2, designed to remove those graduates in long-term employment relationships from the estimated employment outcomes. We also provide an alternative presentation of the results in table 6 in figure 4. In figure 4, the cells are shaded to reflect whether the courses' employment outcomes were in the top, middle or lowest third group of outcomes. The VET publication includes a 'services, hospitality, transportation' category. In the higher education publication, these fields are included in the 'business' category. In both tables and figure 4, we present the TAFE outcomes for the combined business category as it appears in the higher education data, as well as separately for the 'business' and 'services, hospitality, transportation' categories, as they appear in the TAFE classification.

Abstracting from the detail of the results for specific fields at different qualification levels, the key conclusion is that similar fields have better employment outcomes in both sectors. The correlation between the Bachelors column in table 5 and the total column for the TAFE sector is 0.63, indicating that those fields with strong employment outcomes for Bachelor graduates are also the ones that tend to have strong employment outcomes for TAFE graduates. In table 6, the correlation is 0.5.

Employment outcomes tend to be stronger in architecture and building, engineering and surveying and health and community services among Bachelor graduates as well as across different TAFE qualification levels. Science and the humanities have low employment outcomes among TAFE qualifications as well as among Bachelor graduates. Discussion in GCCA (1999a) focusses on full-time employment rates among only those 'available' for full-time work, which excludes full-time students from the denominator of the employment 'rate'. It is certainly the case that among the sciences, and some areas of the humanities, individuals seem more likely to engage in further study. However, even after considering this, the GCCA's results indicate that graduates from these fields have lower full-time employment outcomes than those of other fields. Hence, at least in the aggregate, the results presented here would appear to reflect differences in the employment rates of different fields.

One set of results that stand out from the tables is the employment outcomes of graduates of TAFE multi-field education courses. These outcomes were lower than those of other fields, whatever the qualification level considered, and in most cases they were substantially lower.

Not only are the overall employment outcomes low, less than half of those who found jobs obtained full-time jobs (42%).

The graduates of TAFE multi-field education undertook courses in English as a second language, literacy and numeracy courses or pre-vocational/pre-employment courses. Students of such courses tend to be concentrated in low-level certificate qualifications, where the education continuation rates are quite high. Hence, it seems likely that individuals choosing to undertake further education and training courses might explain part of the lower employment outcomes for these courses. However, this could be only a small part of the explanation for these courses' poorer employment outcomes since the unemployment rates among graduates in those courses were also high.

The nature of these courses suggests that graduates of them would be among the more disadvantaged in the labour market and, hence, more likely to be unemployed or not in the labour force before undertaking their course. From figure 1, we know that these individuals have substantially worse employment outcomes than other groups of graduates. Despite the disadvantaged nature of the characteristics of those students undertaking TAFE multi-field education courses, their employment outcomes could only be seen as disappointing. The outcomes are comparable to the employment outcomes of the most disadvantaged groups in the ABS' SEUP job seeker category, presented in table 2.

5.2 Outcomes for different social groups

In this section we re-analyse some of the employment and education outcomes we have already discussed for some specific groups of graduates. The specific groups we look at are males, females and young graduates. Since we make use of only the published data, the representation is more limited than much of what has already been presented. In addition, we have already considered the occupational and wage outcomes of young workers in their first full-time jobs. We do not repeat that discussion.[21]

In table 7, we replicate much of the material on employment outcomes that appeared in table 2, this time presenting the outcomes for males and females and for those aged less than 25 years and those 25 or over.

Male and female employment outcomes

In terms of differences between the sexes, the major feature is that the employment outcomes for females in TAFE are substantially worse relative to those of males than is the case for Bachelor graduates. Compared to men, women's outcomes in TAFE were lower in aggregate and had a substantially different pattern. Just over one-third of female TAFE graduates worked full time, while two-thirds of men worked full time. Women were much more likely to work part time.[22] The pattern of employment outcomes by qualification level was broadly comparable between males and females.[23] Female employment outcomes among Bachelor graduates were better in aggregate than male ones and only slightly below male full-time employment rates.[24]

In figure 5, we compare the success of different groups of male and female TAFE graduates in obtaining full-time work. That is, we show how TAFE male and female graduates' employment outcomes differ according to their pre-course labour market activity. Participation in a TAFE course appears to provide a much more substantial boost to the employment outcomes of those males who were not employed full time prior to their course than it does for similar females.

Comparing the sectors, male employment outcomes were higher among TAFE graduates than Bachelor graduates, reflecting higher full-time employment rates for TAFE graduates. The aggregate female rates were higher for Bachelor graduates, reflecting almost entirely poorer TAFE outcomes among those female graduates aged 25 or more. Female Bachelor graduates were more likely to be employed full time than TAFE graduates.[25]

Table 5: Employment rates: qualification level by field of study[a]

Field of study	Bach.	Dip.	Assoc. dip.	Adv'd cert. – post-trade	Adv'd cert. – other	Cert tra
Land and marine resources, animal husbandry	72.1		88.5		85.1	9
Architecture, building	74.4		84.7		88.0	9
Arts, humanities and social sciences	51.0	64.2	80.8		63.5	
Business, administration, economics (inc. hospitality)	76.4	88.8	78.9		80.2	9
Education	80.9					
Engineering, surveying	77.7		81.2	86.9	89.0	9
Health, community services	88.1	90.3	82.4		73.8	9
Law, legal studies	66.1		83.0			
Science	52.0	84.6	82.8		79.5	
Veterinary science, animal care	87.6				88.6	
Services, hospitality, transportation		88.2	80.1		60.6	9
Business, administration, economics			78.7		83.1	
TAFE multi-field education						
Total for qualification	**68.1**	**77.7**	**81.2**	**87.1**	**79.8**	**9**

Note:

(a) The employment rate is the percentage of responding graduates employed afte

Qualification level								
t. – ade	Cert. – other	AQF Adv'd dip.	AQF dip.	AQF Cert. IV	AQF Cert. III	AQF Cert. II	AQF Cert. I	**Total TAFE grad.**
0.8	82.2		66.7	77.9	76.6	73.8	58.2	**79.8**
3.3	76.0		85.9	69.1	91.1	81.3	71.4	**87.3**
	51.7	64.9	64.6	57.4	56.4	49.8	42.0	**59.6**
2.8	69.2	68.9	76.3	82.3	77.9	65.5	62.3	**74.5**
				92.8	75.9			**89.4**
2.5	80.8	78.9	71.9	78.0	85.9	71.9	77.2	**85.4**
6.2	79.8	91.3	81.5	79.8	68.4	63.4	87.5	**75.5**
	92.9		92.3					**90.1**
			64.8	60.6	62.7	77.8		**64.7**
	87.4				70.2			**83.6**
2.8	69.9	90.5	85.1	76.7	80.3	66.9	66.6	**76.2**
	69.1	67.5	73.5	83.1	76.4	64.6	52.9	**73.8**
	32.1			33.1	31.4	27.2	40.8	**31.9**
2.7	**68.9**	**70.4**	**75.3**	**77.6**	**70.7**	**56.3**	**58.1**	**72.8**

r their course. Cells with less than 50 graduates were excluded from the analysis

Table 6: Adjusted employment rates: qualification level by field of study

Field of study	Bach.	Dip.	Assoc. dip.	Adv'd cert. – post-trade	Adv'd cert. – other	Cert. trad
Land and marine resources, animal husbandry	64.1		83.6		75.4	84
Architecture, building	63.3		81.2		81.8	90
Arts, humanities and social sciences	46.5	59.4	74.4		51.5	
Business, administration, economics (inc. hospitality)	61.4	87.3	72.3		68.2	89
Education	67.4					
Engineering, surveying	68.4	67.9	73.2	76.3	73.0	88
Health, community services	81.6	88.4	77.8		65.5	
Law, legal studies	54.6		71.2			
Science	47.3		78.1		74.2	
Veterinary science, animal care	87.0					
Services, hospitality, transportation		87.0	76.4		46.9	89
Business, administration, economics			71.5		72.0	
TAFE multi-field education						
Total for qualification	**59.3**	**73.7**	**75.1**	**77.0**	**68.2**	**89**

Note:

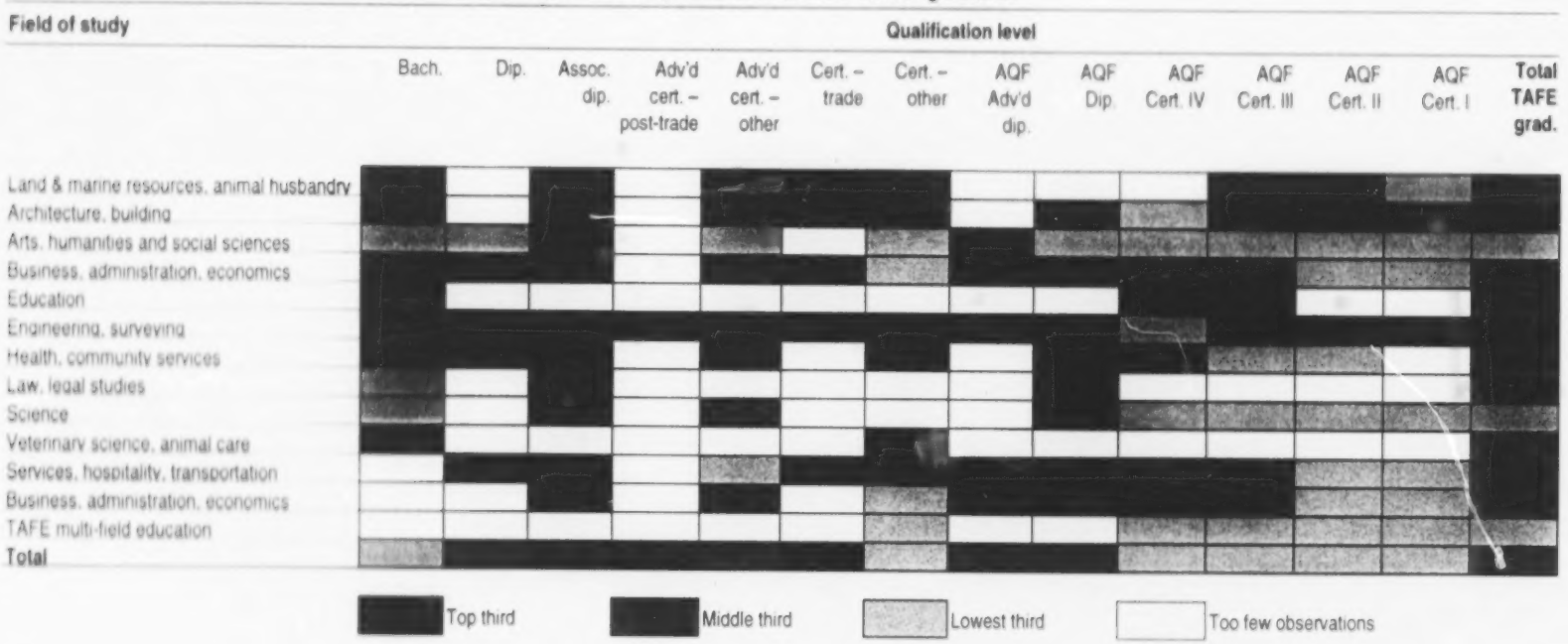
(a) The employment rate is the percentage of responding graduates employed afte after their course excluded from the analysis in the case of TAFE graduates. Fo before May in their final year and remaining with the same employer after their were excluded from the analysis

[a]

Qualification level								
– de	Cert. – other	AQF Adv'd dip.	AQF Dip.	AQF Cert. IV	AQF Cert. III	AQF Cert. II	AQF Cert. I	**Total TAFE grad.**
.5	70.9				63.9	60.7	44.1	**68.4**
.5	71.1		79.6	56.3	86.9	79.2	69.1	**82.7**
	37.2	60.3	56.9	44.4	37.2	35.6	22.9	**47.6**
.2	56.6	62.2	66.9	65.0	69.2	55.1	52.6	**63.3**
				75.4	63.8			**70.6**
.9	68.4	72.9	63.9	56.6	77.5	61.6	72.3	**78.0**
	66.6		76.6	71.9	56.6	49.2		**66.4**
			82.1					**78.1**
			60.0	43.8	42.2	56.4	22.2	**49.8**
	75.3							**72.1**
.2	62.9	89.5	81.7	71.9	73.7	59.4	56.9	**69.4**
	54.5	60.2	61.3	63.4	66.3	52.1	44.1	**60.5**
	26.9			22.7	22.7	19.0	31.8	**23.8**
.2	**55.5**	**63.5**	**67.2**	**59.7**	**58.8**	**44.8**	**49.5**	**61.6**

r their course, with those employed with the same employer before, during and
r higher education graduates, those employed with the same employer full time
course were excluded from the calculations. Cells with less than 50 graduates

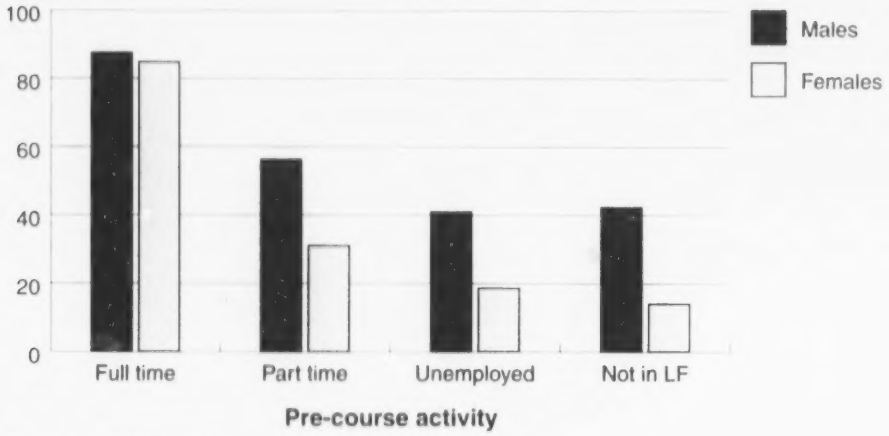
Figure 4: Adjusted employment rates: Qualification level by field of study—Bachelor and TAFE sector graduates[a]



Note:

(a) The employment rate is the percentage of responding graduates employed after their course, with those employed with the same employer before, during and after their course excluded from the analysis in the case of TAFE graduates. For higher education graduates, those employed with the same employer full time before May in their final year and remaining with the same employer after their course were excluded from the calculations. Cells with less than 50 graduates were excluded from the analysis

Figure 5: Proportion of TAFE graduates working full time after their course by the pre-course activity—males and females



Source: NCVER (1998)

Employment outcomes by age

When we look at the employment outcomes for the younger and older groups, it is clear that the adjustment that excludes those in long-term employment relationships has a considerable effect on the relative outcomes. In all cases, the employment outcomes of older graduates deteriorate relative to younger ones, and in all cases they are lower than those of younger graduates (see table 7a).

Continuing education outcomes

The rates within each sector at which males and females undertook a further course of study or training were broadly similar. However, the rates differ by age. Younger Bachelor graduates were more likely to continue with study than older graduates.

Among TAFE graduates, the patterns are a little different. Almost half of those aged 15–19 continue with some form of study. The rate then falls among 20–24-year-olds to just over a third, before increasing again for older age groups. What is of note about the lower continuation rate among 20–24-year-olds is that this is the largest group of TAFE graduates, containing about a quarter of all graduates. What is more, the fall off in participation among this group seems to affect TAFE rather than other education sectors. When those in that group do study, their participation in TAFE courses is lower than that found among other groups. This phenomenon among 20–24-year-olds may well be explained by the concentration of male trade certificate graduates in this group. If they, for some reason, are considerably less likely than other groups to continue in a further course immediately after completion of their certificates, the overall figure could well be driven down. This analysis points to a possibly unexploited market for TAFE institutions[26] (see table 7b).

Table 7a: Male and female employment outcomes by qualification completed (percentages)

	Male				Female			
	Working full time	Working part time not studying full time	Total employ-ment rate	Adjusted employ-ment rate	Working full time	Working part time not studying full time	Total employ-ment rate	Adjusted employ-ment rate
Total Bachelors	57.8	9.9	67.7	56.1	50.7	17.5	68.2	61.0
Aged 24 or less	53.0	11.0	64.0	60.6	50.5	14.8	65.3	63.0
Aged 25 or more	65.4	8.2	73.6	48.7	51.1	22.2	73.3	59.3
Diploma	49.3	20.7	70.0	60.7	46.4	33.1	79.4	76.5
Associate diploma	68.8	13.4	82.2	74.5	50.4	28.1	78.5	72.8
Advanced cert. – post-trade	83.2	5.3	88.5	78.0	48.1	25.9	74.1	66.7
Advanced cert. – other	76.6	9.7	86.3	73.1	43.3	28.8	72.1	60.3
Certificate – trade	91.0	2.4	93.4	89.8	73.6	11.5	85.1	79.4
Certificate – other	63.9	11.0	74.9	59.9	34.2	28.5	62.7	47.4
AQF Advanced diploma	52.1	16.9	69.0	59.4	46.0	23.4	69.4	63.2
AQF Diploma	52.3	20.2	72.4	59.3	43.3	31.3	74.6	67.4
AQF Cert. IV	65.3	13.2	78.5	54.1	44.8	30.0	74.9	56.6
AQF Cert. III	64.1	11.5	75.6	61.3	33.6	31.8	65.4	52.3
AQF Cert. II	46.5	13.4	59.9	48.0	25.5	25.9	51.4	38.1
AQF Cert. I	52.6	12.5	65.1	56.6	22.2	25.6	47.7	37.5
Total TAFE	67.7	10.8	78.4	66.3	36.9	28.6	65.6	53.0
Aged 15 to 19	60.3	14.7	75.0	68.5	38.0	31.4	69.3	62.9
Aged 20 to 24	71.7	10.8	82.5	77.2	47.4	25.8	73.2	64.6
Aged 25 or more	67.2	9.6	76.8	55.0	32.8	29.1	61.9	45.8

Source: NCVER (1998); GCCA (1999a)

Table 7b: Male and female education outcomes (percentages)

	Male	Female	Persons	Studying at		
				University	TAFE	Other
Bachelor graduates studying full time						
Aged 24 or less	26.4	26.6				
Aged 25 or more	16.5	13.4				
TAFE graduates studying						
All ages	36.4	40.2	38.5	9.1	26.0	3.4
Aged 15 to 19			45.8	8.0	33.0	4.8
Aged 20 to 24			35.7	11.5	21.2	3.0
Aged 25 or more			38.0	8.2	26.5	3.3

Source: NCVER (1998); GCCA (1999a)

Male and female occupational outcomes

We now compare the occupation outcomes of males and females in the two sectors. In table 8 we present information about the occupational distributions of male and females in the sectors and differences in remuneration. For both sectors, among graduates who worked full time, males earned more than females. The difference was more marked among TAFE graduates, where the distribution of graduates across occupations differed more between males and females.

Among Bachelor graduates, the distribution of graduates across occupations was very similar for males and females. The distributions were also similar for those who worked part time, other than for those not seeking full-time work, where females were more likely to work as professionals than were males.

The TAFE publication does not provide information on the occupational distributions of males and females for total or full-time employment. It does, however, provide information on those distributions for one group of graduates—those employed after their course who were not employed before it. That information is presented in table 8. It is unlikely to reflect accurately the broader distributions, though it does point to some elements that are bound to be features of the broader distribution. Males were more concentrated among the tradespersons category than were females and were more likely to work as labourers. Females were more likely to be concentrated among clerical, sales and service jobs.[27]

Male and female wage outcomes

Male Bachelor graduates were paid more than females. However, the male rate was less than overall male AWE, but 19 per cent more than that received by males aged 20–24. Female Bachelor graduates earned more than both total female AWE and the AWE of those women aged 20–24.

Male TAFE graduates were also paid more than female graduates. Full-time female graduates earned 87 per cent of the wage received by males. Dumbrell et al. (2000) undertook a detailed analysis of wage differences between the genders in the 1997 TAFE destination survey. They found that a wage differential between males and females was evident at most ages in six separate industries they analysed, even after adjusting for the longer hours males tended to work.

TAFE graduates of both sexes earned less than their own sex AWE in most occupations. When we adjust the occupational AWE figures to reflect the age distribution of TAFE graduates, the pattern for males and females is broadly similar across occupations. Once more, the aggregate figures are dragged down by the tradespersons category; a result which we noted previously probably reflects the relatively lower age of tradespersons among TAFE graduates.

Table 8: Male and female—occupational distribution and wages

Higher education

	Bachelor graduates		All graduates			
	Employed full time		Employed part time			
			Seeking full time		Not seeking full time	
	Male %	*Female %*	*Male %*	*Female %*	*Male %*	*Female %*
Managers and administrators	8.4	4.3	1.7	1.6	2.2	2.6
Professional	63.6	68.6	32.5	37.7	42.6	63.1
Para-professional	15.2	11.1	11.4	10	14	8.5
Tradespersons	0.3	0.1	0.6	0.2	0.7	0.2
Clerical workers	4.3	6.9	6.0	9.6	6.1	7.1
Salespersons and personal service workers	4.4	7.0	38.6	39	28.6	18
Labourers	1.9	0.4				
Other	1.9	1.6	9.2	1.8	5.7	0.6
Skill index	1.00	1.04	0.36	0.48	0.58	0.92
Proportion of jobs less skilled	0.840	0.850	0.642	0.685	0.718	0.822
Median wage ($)	32 000	30 000				
Aged 24 or under	31 000	30 000				
Ratio to own sex 20–24 AWE	1.19	1.15				

TAFE: Occupational distributions

	Employed after course, not before			
	Full time		Part time	
	Male %	*Female %*	*Male %*	*Female %*
Managers and administrators	1.5	0.9	0.8	0.6
Professionals	5.0	6.8	9.4	8.2
Associate professionals	10.1	11.9	7.6	5.3
Tradespersons	62.5	12.8	12.8	3.1
Advanced clerical and service	0.8	10.1	2.2	4.8
Intermediate clerical, sales and service	6.0	43.2	21.2	48.9
Intermediate production and transport	3.9	2.1	10.2	2.0
Elementary clerical, sales and service	2.3	8.4	18.6	18.6
Labourers and related workers	7.8	3.9	17.2	8.6
Skill index	0.2	-0.106	-0.4	-0.343
Proportion of jobs less skilled	0.562	0.458	0.339	0.366

TAFE: Full-time wages

	Compared with			
	AWE		Adjusted AWE	
	Male	*Female*	*Male*	*Female*
Managers and administrators	0.856	0.804	1.184	1.087
Professionals	0.834	0.909	1.077	1.049
Associate professionals	0.917	0.891	1.100	0.998
Tradespersons	0.804	0.922	0.874	0.914
Advanced clerical and service	0.823	0.948	0.973	1.024
Intermediate clerical, sales and service	0.888	0.904	1.014	0.955
Intermediate production and transport	0.958	1.000	1.051	1.022
Elementary clerical, sales and service	0.882	0.899	0.955	0.914
Labourers and related workers	0.892	1.082	0.932	1.130
Skill index				
Proportion of jobs less skilled				
Total	**0.802**	**0.862**	**0.941**	**0.954**
Mean wage ($)	602	522		

6 Employment and education outcomes in one multi-sector institution

In this section, we use individual-level data from one institution to identify the determinants of some of the national employment and education outcomes discussed in the earlier sections. We set out the approach to modelling reflected in the equations we estimate, summarise the institution's data and compare them with the national data and report the results of the estimated equations.

6.1 Individual decision-making

We use the 1997 GDSs of 1996 graduates from one metropolitan institution with VET and higher education sectors to isolate the effect on outcomes of individual characteristics and the role of the two sectors. We analyse the outcomes of graduates from that institution who were Australian citizens.

The major advantage of using individual-level data to identify the determinants of the various outcomes is that it enables identification of any systematic differences between individuals who undertake various courses to be identified. Where we can identify the role of individual differences in these outcomes, we can isolate the effect of participation in different level courses on those outcomes. The advantage from using data from one institution is that it minimises the differences that might exist in the respective cultures, teaching methods and practices, student services and administrative arrangements that exist between the VET and higher education sectors. Of course, a disadvantage is that the data may be unrepresentative of either sector.

In our analysis of the institution's data, our main focus is to identify the determinants of which individuals were employed full time following their courses. We ran supplementary analyses to determine which graduates were employed in high-skilled occupations; received the highest wages; and were likely to be studying, and some of the features of that study. We report the outcomes of those analyses in a condensed manner.

In figure 6, we set out a framework for describing the decisions of individuals to undertake education and training courses and their subsequent employment outcomes. The framework involves a simple, sequential decision-making process. By some means, individuals determine some desired occupation. That decision leads them to undertake an education or training course in some field at a particular level.[28] In turn the actual post-course employment status and the occupations of individuals reflect, in part, the courses they have undertaken. The occupations in which individuals work and their actual education levels determine the wages they receive in their jobs.

In all of these decisions, other factors such as personal background and other characteristics, including ability, influence the decisions individuals make. What the decision-making framework is designed to highlight is that the employment, occupation, education and wage outcomes are inherently inter-related.

This framework is embedded in the econometric approach we adopt here. The main implication of the framework is that in analysing the employment outcomes in the lower panel of figure 6, we cannot treat the previous decisions as entirely separate determinants of those outcomes. Hence, in determining the occupational outcomes of individuals, the education level (or field of study) cannot be treated as having been made outside the framework. Similarly, education level

and occupational outcomes are not exogenous (made outside the framework) in determining individual wage outcomes.

If we ignore the inter-relationships between these outcomes, inferences drawn about the role of education and training qualifications in employment outcomes might be incorrect. Policies based on incorrect inferences will obviously not be soundly based.

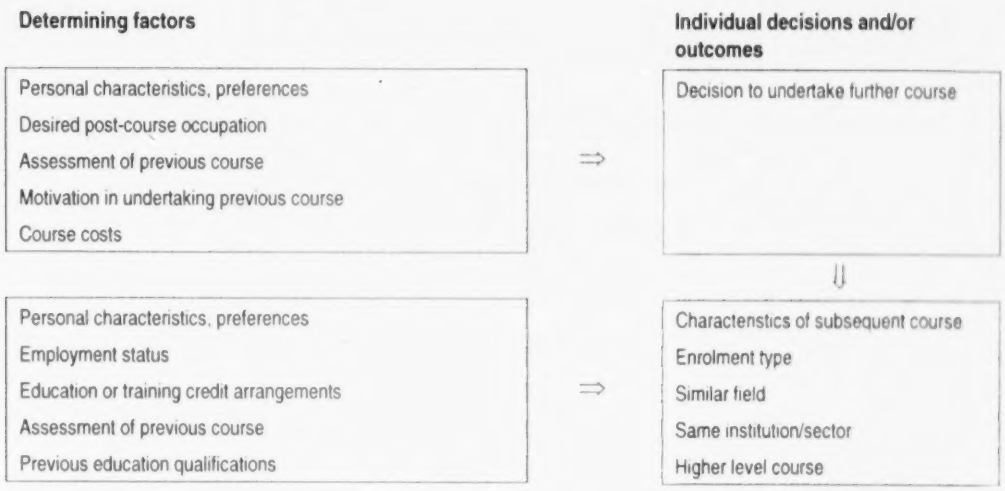
Figure 6: Sequential decision-making framework—description of the employment outcomes of education courses

Determining factors		Individual decisions and/or outcomes
Age and other personal characteristics including ability, SES, ambition Previous education qualifications	⇒	Pre-course activity
		⇓
Personal characteristics, preferences Relative wages	⇒	Desired post-course occupation
		⇓
Personal characteristics, preferences and course costs	⇒	Desired education qualification (field and level)
		⇓
Personal characteristics Supply of places	⇒	Actual qualification completed
		⇓
Desired post-course occupation Personal characteristics	⇒	Employment obtained or not
		⇓
Desired post-course occupation Actual qualification completed Personal characteristics	⇒	Occupation obtained
		⇓
Actual qualification completed Personal characteristics Employer characteristics	⇒	Initial post-course wages

Shading indicates that outcomes/decisions *within* the shaded area are determined at approximately the same time.

In figure 7, we set out a simpler framework for looking at individual decisions to undertake a subsequent education and training course. We describe the participation decision as reflecting individual characteristics, occupational aspirations and the assessment by individuals of their previous course. We assume that those with a more positive assessment are more likely to undertake a further course.

Figure 7: Individual decision-making framework—description of the subsequent education participation of course graduates



Given that many individuals do undertake some course in the following year, we endeavour to determine the factors that influence some of the characteristics of those courses. Specifically, what are the determinants of the type of attendance, field of study and level of the course that individuals undertake? In addition, can we identify what determines why individuals remain at the same institution or leave it to undertake their subsequent course?

6.2 Comparison with national data

Despite our concerns about how representative the data from any one institution might be, the data we use reflect many of the features prevalent in the national destinations data. We summarise the data in table 9. Consistent with the national data:

- full-time employment rates tend to increase with qualification level
- female full-time employment outcomes from higher education courses are considerably above those of VET courses
- males have substantially better employment outcomes from TAFE courses than do females and higher (unadjusted) outcomes from higher education
- higher education graduates tend to enter more skilled occupations than do TAFE graduates. Male TAFE graduates are concentrated in trade-related occupations
- TAFE graduates are more likely to be studying in the year following their graduation than higher education graduates, with male and female graduates studying at roughly the same rate

At least two features of the data are not representative of the national figures, however. The first is that female higher education graduates at this institution have lower full-time employment outcomes than male graduates of either VET or higher education, and this difference persists after taking account of pre- and within-course employment. Second, in these data, higher education graduates in their first full-time jobs tend to be paid more in all occupations than TAFE graduates.[29]

Table 9: Summary of institution-level data

	In 1997 proportion:			
	Working full time		Studying	
	Male %	Female %	Male %	Female %
AQF Cert. II	50.0	20.8	12.5	39.6
AQF Cert. III or Trade cert. or Cert. – other	78.6	33.9	26.7	37.1
AQF Cert. IV or Adv. cert. – trade or other	52.2	37.4	46.7	43.0
Diplomas—Ass. dip., AQF Dip., Adv. dip. or Adv. cert.	40.6	41.0	47.4	39.4
VET – Total	54.9	37.5	40.2	39.9
Bachelor – pass	57.4	47.4	23.0	21.3
Bachelor – honours	52.9	21.6	29.4	37.3
Grad. cert. or diploma	56.4	48.4	34.5	24.4
Masters	68.6	62.6	14.9	14.3
PhD	69.2	55.6	7.7	0.0
HE – Total	58.3	47.7	24.3	21.8
	VET		**HE**	
Occupational distribution	Male %	Female %	Male %	Female %
Elementary white collar, production, labourers	16.0	18.7	2.7	3.0
Semi-skilled clerical, sales, service	6.0	27.6	7.0	16.5
Ass. professional, trades	59.1	28.6	18.9	13.2
Management	6.0	3.9		
Professional level	12.9	21.2	71.3	67.3
Occupational wages (first full-time jobs)	Male $	Female $	Male $	Female $
Elementary white collar, production, labourers	473.9	451.7	553.3	548.7
Semi-skilled clerical, sales, service	761.2	444.7	578.5	497.8
Ass. professional, trades	518.1	516.6	683.0	560.6
Management	622.5	644.3		
Professional level	557.8	501.1	683.5	593.7
Total	**528.9**	**484.1**	**673.1**	**568.8**

Note:
HE: higher education

Source: Unpublished institutional data derived from graduate destination surveys

The national figures for 1997 graduates in 1998 for both sectors are similar to those of the previous year, to which the institution's data relate. Compared to the national TAFE employment outcomes in table 7a, the outcomes for males from this institution are slightly lower, while those for female TAFE graduates are comparable with the national figures. The male higher education graduates are about average, while the female outcomes are below average.[30]

On the basis of these comparisons, we consider that the data from the single institution is broadly representative of the national data, and its analysis might help us understand some of the factors that lie behind the national employment and education outcomes.

6.3 Individual employment outcomes

In this section, we summarise the results of the econometric analysis foreshadowed earlier. We focus on the results of equations designed to highlight the factors that determine which graduates work in full-time jobs after completing their courses.[11] These equations were estimated over all those individuals who were not studying full time.[12] After we account for differences in the characteristics of individuals who complete various courses at this institution and one feature of some higher education courses, we find that completing a higher education qualification rather than a TAFE one improves the employment outcomes of females, but not males.[13] However, completing a higher education course with a 'sandwich' year, involving some form of structured work experience, improves both male and female full-time employment outcomes.

There are some clear differences between the results for the sectors that presumably reflect the different natures of the labour markets for their graduates. TAFE graduates' employment outcomes were influenced by the state of the regional labour market where they lived. Higher education graduates were not. Employment outcomes were higher among Australian-born TAFE graduates, but not higher education graduates. The TAFE result did not appear to reflect language background particularly since inclusion of a variable capturing whether individuals were from a non-English background did not affect the results and was not significant.

We summarise the results of most interest to us in table 10, where we show how the probability of an 'average' graduate having a full-time job following their course would change if some of their characteristics or those of their course were to change.

The major effects appear to be those associated with the pre- and within-course employment experiences of individuals. Males and females who worked full time in their final year were substantially more likely to be employed full time following their course than those who did not. Those higher education graduates who worked part time during their course were also substantially more likely to work full time after it than those who did not work. Graduates who worked full time before their course, regardless of what they did during their course, were also generally more likely to work full time after it.[14]

Those male TAFE graduates who remained with their within-course employer were more likely to work full time, while this effect was more likely to involve part-time work for female higher education graduates.

Previous completion of a qualification did not add to individuals' employment outcomes, and for female TAFE graduates the effect was close to being significantly negative (and was significant in some specifications). That is, holding a prior qualification might penalise individuals in obtaining a full-time job. Such an effect might arise if employers treat an individual's under-utilised initial qualification as a signal of previous potential employers' assessments of them.[15] This result was not changed by the inclusion of a more detailed specification of the level of the prior qualification.[16]

There are substantial differences in employment rates by field of study. In table 10, we present the change in the probability of being employed full time if an individual with a set of characteristics completed some course other than an architecture and building qualification. For example, those higher education graduates who completed an arts, humanities and social sciences course had a significantly lower probability of being employed full time following their course than graduates from some other fields.

The estimated effects in table 10 and the observed characteristics of graduates enable us to identify the reasons why male and female graduate full-time employment outcomes differ at this institution. About two-thirds of the nearly 20 percentage point difference in TAFE outcomes arises because of the male graduates' more extensive employment backgrounds, both before and during their courses. The remainder of the difference in overall outcomes reflects differences in the fields of study males and females engage in. The employment outcomes for females would have been higher if their distribution across fields of study was more like the male one. In

particular, the concentration of females in humanities and health and community service courses explains much of the rest of the difference in aggregate outcomes. Most of the difference in employment outcomes between males and females of just over ten percentage points in higher education at this institution appears to reflect the same field of study effects.

Regression results from equations explaining the occupational and wage outcomes of graduates of the two sectors confirmed the impression given by the summary of the institution's data given in section 6.2. Higher education graduates were much more likely to enter the higher skilled and better-remunerated professional occupations than were TAFE graduates. In addition, those with higher education qualifications were paid more than TAFE graduates, regardless of the occupations in which they work.[17]

Table 10: Effects of field of study on full-time employment outcomes—change in the probability of full-time employment

	Male		Female	
	Higher ed.	TAFE	Higher ed.	TAFE
	% point change		*% point change*	
Background characteristics				
Previous post-school qual.	1.0	-7.0	-5.5	-11.3
Pre-course: at school	9.7*	10.3	3.0	24.6*
Pre-course: worked full time	3.3	13.3*	39.0*	36.0*
In course: worked full time	73.2*	32.2*	73.1*	42.9*
In course: worked part time	25.0*	2.3	43.1*	6.7
Still with final year employer	3.6	22.1*	-13.6*	7.9
Field of study				
Arts, humanities and social sciences	-23.7*	-36.5*	-19.1*	1.4
Business, admin., services, hosp., trans.	15.7*	-24.0*	9.6	11.9
Education	-6.8		-24.5*	
Engineering, surveying	19.0*	-11.6	3.9	19.2
Health, community service	7.2	-8.6	-15.7*	-5.7
Law and legal studies	9.4		-3.5	
Science	12.5	-11.2	-8.5	
TAFE multi-field study				-5.3
Course characteristics				
'Sandwich' year	16.4*		15.7*	
Higher education course	1.6		8.4*	
Studied full time	15.4*	6.6	11.7*	1.7

Note:

*Indicates significant at the 95 per cent level

Source: Derived from parameter estimates in tables B.2 and B.3

6.4 Determinants of whether graduates continue with further study

In this sub-section, we set out briefly the results from our attempt to determine which individuals undertake another course in the year following their earlier course and the factors that influence some of the characteristics of those subsequent courses. The characteristics of the course we analyse are whether it is in the same field as the previous one, whether it is a higher level qualification and whether, in the case of higher education graduates, it is undertaken at the same institution. For VET graduates, the last characteristic we look at is whether they are studying at a TAFE institute or not. In reporting this work we focus on the role of individuals'

experiences in their first course, as reported through their responses to the CEQs, on their subsequent participation in a further course.

Our first step was to undertake factor analyses of the CEQ responses for individuals of the two sectors. Analysis of the higher education graduates' CEQ responses returned the five CEQ factors reflecting graduates' assessments of their courses: quality of *teaching*; clarity of *goals and standards*; nature of the *assessment methods*; *workload*; and enhancement of their *generic skills* (see GCCA 1999c and 1999d for discussion of the higher education CEQ). We estimated a 'score' for each of these items for higher education graduates, reflecting their responses to the various CEQ questions and the weighting each prompt received from the factor analysis. These scores were centred on zero and indicated whether graduates had above or below average assessments of their course in relation to each of the five items compared to all other graduates from the institution. Graduates' overall assessments of their courses were similarly normalised.[38]

A similar factor analysis of the VET graduates' assessments of their courses yielded two important factors. One gave greatest weight to their assessment of the quality and availability of equipment, which we describe as an assessment of their institution's *facilities*.[39] The other factor reflected graduates' assessment of their courses' *employment effect* or *role*. The latter factor picked up individuals' responses about the career and job information available to them, the effect of the course on their job prospects and employer assessments of their qualifications, as perceived by graduates. We generated scores for these factors and the graduates' overall assessment of their course in a similar manner to that described for higher education graduates.

Modelling the education participation decisions of individuals, along with some of the characteristics of their courses, is not straightforward. The various decisions to study and the characteristics of that study are likely to be related, yet modelling all of the decisions simultaneously is computationally burdensome. The approach we adopted was to model the 'studying or not' and 'working full time or not' outcomes jointly for individuals, calculating selection correction terms for those two decisions and including those selection terms in a series of separate equations explaining the determinants of the characteristics of courses individuals undertook.[40] Separate sets of equations were estimated for males and females in the two sectors (four sets in all).

Other modelling approaches to this problem are possible and not all of the technical difficulties in undertaking the one we pursued were resolved.[41] Consequently, the results can be considered quite speculative, and we present only a summary of the role of the various CEQ factors in influencing graduates' subsequent education participation. We report these effects in table 11. We take a non-rigorous approach to identifying those variables that are 'important' in influencing that education participation. Some of the variables were not significant at conventional levels in the equations we estimated.[42]

The results suggest that students' assessments of their courses do affect systematically their subsequent education participation. Those higher education graduates with positive overall course assessments were more likely to be studying, while those who were studying but disliked the *assessment methods* in their first course were more likely to change institutions (and broad field of study in the case of females). Females who were studying and rated the *teaching* in their first course highly were more likely to remain with the same institution.

The results of most interest among the TAFE graduates centre on their assessment of the *employment role* of their courses. Where this is positive and graduates were engaged in further study, they were more likely to remain in the same field. For females, this factor had a negative effect on whether they undertook a higher level qualification. That is, those with a positive view of the *employment role* of their course would not undertake a higher level course, while those with a negative view would. In fact, the latter effect dominated the results. Those females who undertook higher level courses tended to have negative views about the *employment role* of their previous course. Their subsequent participation in education and training courses therefore seems to reflect their failure to achieve their objectives from their first course than a more positive motivation.

Table 11: Direction of the effect of student assessments of their previous courses on subsequent education participation

	Studying or not	Higher level qual.	Same field	Same inst. or sector
Males				
Higher education				
Overall assessment	P			
Good teaching			N	
Generic skills				
Work load				
Assessment method		N		N
Goals and standards				
TAFE				
Overall assessment				
Facilities				
Employment prospects			P	N
Females				
Higher education				
Overall assessment	P	P		
Good teaching				P
Generic skills				
Work load				
Assessment method			N	N
Goals and standards			P	
TAFE				
Overall assessment				
Facilities				P
Employment role		N	P	

Note:

P: Positive; N: Negative

Source: Parameter estimates derived from the analysis of unpublished institutional data

These results are quite speculative, but do point to areas that might benefit from further research. Knowing what factors are important in continuing students' choices between institutions, course levels and fields of study is obviously of considerable importance to institutions in focussing improvements in their courses in both sectors. After all, if institutions are able to implement strategies that improve their students' assessments of their courses in key areas, it would appear that they might be able to increase the chances of retaining students for further courses of education and training. The importance of improved CEQ outcomes for institutions appear to go well beyond their standing in the league tables that aid yardstick competition.

7 Summary and conclusion

In this section, we summarise our findings briefly and identify some of their implications for research and for policy. We found the following:

- The data collected in the GDSs of the higher education and VET sectors provide a satisfactory basis for comparing the sectors' outcomes.
- The aggregate total and full-time employment outcomes of graduates of the two sectors are similar, even after we account for differences in the characteristics and employment backgrounds of individuals in the two sectors.
  - However, the employment outcomes for females were poor relative to both male TAFE graduates and female higher education graduates, reflecting their less extensive labour market experience and their relative concentration in broad fields of study with lower employment outcomes.
  - In general, the employment outcomes of graduates exceeded those of job seekers in the broader labour market over roughly the same period. However, TAFE graduates who were unemployed or not in the labour force before their course had poorer employment rates than the job seeker group, but higher rates than the most disadvantaged job seekers.
- While graduates with pre-course labour market experience had better employment outcomes, both full- and part-time experience during courses had a considerable impact on post-course employment outcomes. Courses with 'sandwich' years also increased employment outcomes. Individuals with prior education and training qualifications had no better employment outcomes than those without them, while females with prior qualifications appeared to do worse than those with them.
- Graduates of higher education courses obtain jobs in different occupations from those of VET courses. Higher education graduates are concentrated in professional occupations (two-thirds of them), while VET graduates are more evenly distributed across occupations, although one-third work as tradespersons.
- Graduates of higher education courses obtain higher paid jobs than graduates from VET courses. However, at least some of this difference appears to reflect the differing occupational distributions of the two sets of graduates.
- A higher proportion of TAFE graduates undertook a further course of study in the year following their graduation than higher education graduates. In addition, individuals' experiences in their courses, as reflected in their CEQ responses, influenced their subsequent course participation. For example, those higher education graduates who undertook a further course but were unhappy with the *assessment methods* in their previous course were more likely to change institutions.
  - TAFE graduates who were studying again but had a poor assessment for their courses' *employment roles* undertook higher level qualifications, seemingly in new fields of study.

Although the quality of the data collected in the VET (particularly) and higher education sectors has improved in recent years, there is considerable scope for improving the presentation of the data, particularly the destinations data, to facilitate cross-sectoral comparisons and to improve accountability for public expenditure.

Implications for research

The findings in this report point to three directions for research. The first is to determine how representative the findings from the analysis of the data from one institution in section 6 are for the sectors more generally. This would require undertaking the type of analysis performed here for larger samples from the national destination surveys. While the data for the institution appeared to be broadly consistent with the national data, there were some differences, and more representative data would improve the precision of the results.

The second direction is to look in a more detailed way than has been done here at the role of student experiences, as measured by their CEQ responses, on their subsequent education participation. The analysis undertaken here was speculative in nature, but it did point to some possible benefits from a careful analysis of the effect of student assessments captured in the CEQ data on subsequent education and training participation.

While institutions' CEQ scores from the destination surveys form part of the discreet yardstick competition for new students now prevalent among higher education institutions, they also reflect the assessments of a significant continuing market for their courses. Knowing what factors are important in continuing students' choices between institutions, course levels and fields of study is obviously of considerable importance to institutions in focussing improvements in their courses in both sectors.

Identifying strategies to increase further participation among low-continuation groups of VET students, most notably young male graduates from trade-related courses, could also help that sector.

The third direction for research is to identify factors that might improve the employment outcomes for women in TAFE. Identification of successful strategies within institutions that improve those outcomes could assist other institutions in lifting female outcomes more generally.

One approach presently pursued by women dissatisfied with their courses' *employment role* in TAFE—to undertake higher level courses in different fields—appears unlikely to succeed since other results presented here suggests that having a previous, possibly under-utilised, qualification may detract from female employment outcomes.

The poor employment outcomes for previous qualification-holders is reflected for both males and females in the national TAFE data, so it may well be a problem for other disadvantaged groups in the VET student population. Hence, the identification of strategies that improve the employment outcomes for specific groups may be of assistance in helping other groups of disadvantaged students.

Policy implications

We identify four main implications for policy arising from the findings of this report.

First, existing government subsidies to the higher education and VET sectors allow the operation of sectors from which graduates obtain employment at better rates than those found by job seekers in the broader population. This supports an argument for maintaining these subsidy levels to the sectors.

Second, if the employment outcomes of the sectors are similar (leaving aside differences in occupational outcomes), but the marginal cost per place are not, and broad employment outcomes are the primary objective of governments, they could choose to allocate marginal funding towards the least cost sector. However, course employment outcomes vary substantially according to their field of study, and any allocation process would need to reflect that variation.

Third, post-course employment outcomes for graduates can be improved by assisting students into employment activities during their courses. Both actual employment during

their courses, primarily full-time employment, along with structured work experience through sandwich years appear to improve employment outcomes, independently of students remaining with the same employers. This experience could be facilitated through either a restructuring of courses to include a work-experience element or the re-direction of student employment services towards facilitating within-course employment.

Fourth, employment outcomes for some groups in TAFE require considerable attention: notably females and those individuals who complete TAFE multi-field of study courses. Once more, the development and/or re-direction of student employment services towards facilitating within-course employment might improve those outcomes. Such services are often poorly resourced within TAFE institutions.

Anderson (1999) reports a survey of TAFE students on the adequacy of student service provision. In a national survey, 82 per cent of students identified provision of employment services as being essential or very important. This proportion was higher than that recorded among 14 other student services. Close to 40 per cent of students considered employment services were either poorly, or not at all, provided. Women were more likely to identify employment services as being important than males, though they were more likely to give higher priority to all forms of student services.

It seems likely that some increase in resources and the re-direction of student employment services towards facilitating within-course employment might improve employment outcomes and reduce what appears to be some unproductive repeat participation by TAFE students.

Notes

1 See Burke (1998) for a discussion of the expansions of the sectors over this period.
2 The specified awards are diplomas, associate diplomas, advanced certificate, certificates, and the Australian Qualifications Framework (AQF) qualifications: Bachelor's Degree, advanced diploma, diploma and certificates I to IV.
3 Future TAFE destination surveys will cover module as well as course completers.
4 For example, see OTFE (1998) for a comparison of the outcomes of students of different Victorian TAFE institutions.
5 Providing individuals recall accurately their pre-course activities and motivation. Both surveys ask individuals to recall their pre-course highest education level, so the exclusion of such a question from the higher education questionnaire cannot be based on doubts about individuals' ability to recall at least some classes of pre-course information.
6 Publications such as Ashenden and Milligan's *Good universities guide* have supported this form of 'yardstick' competition between universities, making use of comparisons in institutions' facilities, the employment prospects or outcomes of their graduates and their graduates' assessments of aspects of their courses. Government agencies have also published such comparisons of elements of the performance of institutions within the sectors (e.g. see DETYA 1998a and OTFE 1998).
7 The ABS higher education data are not confined to those institutions receiving Commonwealth Operating Grants.
8 This comparison was calculated by assigning weights of 1 to 'full year. full-time' students, 0.5 to 'full year, part-time' and 'external' students and 0.3 to all 'part-year' students to the ABS data in table 1. Abbott and Doucouliagos (1999) use similar weights in calculating TAFE full-time equivalents for Victoria, though they apply it to all TAFE students in their study, not just those in vocational courses. Treating participation in other institutions from the ABS data as part of the VET sector suggests that the VET sector is about two-thirds the size of the higher education sector. An alternative approach to comparing the sectors involves estimating VET full-time equivalents (EFTS) by dividing module annual hours by 720 hours, an estimate of a full-time load for a student in VET referred to in Abbott and Doucouliagos (1999). That gives estimated EFTS in VET of 434 000 throughout 1998 from table 1, compared to EFTSU of 524 000 in the higher education sector in March 1998.
9 Alternatively, the GCCA publication reports that 30 per cent of those Bachelor graduates who continued in full-time study worked part time, while eight per cent were working full time (GCCA 1999a: p18). If these figures were included in the higher education employment rates, the Bachelors' total employment rate would increase by 8.4 percentage points to 76.4 and the total higher education rate by about six percentage points to 77.1 per cent.
10 From GCCA (1999b) table 17, 46 per cent of PhD students employed full time worked full time with their present employer in their final year of study. For other qualifications, the proportions were Masters research (60.6%), Masters coursework (68.4%) and other post-graduate(58.4%).
11 These averages were: 78.4 per cent answered their course was of high or some relevance to their job; 29.9 per cent considered their wages had increased as a result of completing their course; 20.5 per cent had received a promotion; and 29.0 per cent considered they had obtained or changed their job as a result of completing their course.
12 The comparison of the occupations of graduates with the rest of the workforce is a somewhat harsh one. It compares their occupational distribution with older, more

experienced workers who have had considerable time to establish themselves in their careers. In the broader workforce, the average job of those working full time was more skilled than 54 per cent of jobs, while that of those working part time was more skilled than 36 per cent of jobs (these figures are based on the May 1998 Labour Force occupation of full-time and part-time workers [ABS 1998d]).

13 Andrews and Wu (1998) compare the starting salaries of graduates with an age-based weighted average of AWE. The AWE of 20–24-year-olds were given a weighting of 60 per cent, with a weighting of 40 per cent placed on the AWE of those aged 20 or more (*sic*).

14 The publication does not provide separate wage estimates for full-time workers not in their first full-time job. It does, however, provide total wage information, along with first full-time, other full-time and total full-time employment figures. Therefore, it is possible to derive the wages for those full-time job holders not in their first full-time job.

15 The AWE figures used in table 4a are taken from unpublished ABS data from the weekly earnings of employees (distribution) survey from August 1997 (ABS 1998b). These provide estimates of AWE by age by occupation.

16 For example, a value of 0.9 means that the TAFE average wage was 90 per cent that of the average wage in the occupation.

17 By analogy, the same effect would drive up the aggregate comparison for higher education graduates since they are more concentrated in the high wage occupations than the overall workforce. For example, if Bachelor graduates received 80 per cent of AWE in each occupation, the total figure across all occupations using the actual distribution of Bachelor graduates who worked full time would be 15 percentage points higher at around 0.95.
A simple numerical example suffices: suppose the workforce is evenly distributed across three occupations with wages of $500, $400 and $300 respectively, so that the average wage is $400. In each occupation graduates receive 80 per cent of the occupational wage ($400, $320 and $240). Suppose 70 per cent of graduates are employed in the first occupation, 20 in the second and 10 in the third. The average graduate wage is $368 (280+64+24), or 92 per cent of the economy-wide average.
This suggests that the 'true' relative wage comparison in occupations must be considerably lower than the GCCA's aggregate figure of 80.6 per cent in 1998. A number close to 68 per cent of wages applied uniformly in all occupations would give an aggregate figure of around 80 per cent, given the distribution of full-time Bachelor graduates at the ASCO major group level.
When we estimate these wage relativities with the data we use in section 6, we find that the median salary of Bachelor graduates aged less than 25 working full time was 75 per cent of full-time AWE (AWE as average weekly total earnings of full-time non-managerial employees taken from ABS (1999). However, in professional occupations, where two-thirds of the institution's graduates were employed, the relativity was 61 per cent. In fact, the 75 per cent figure was reasonably representative of wage relativities outside professional occupations. However, it was quite unrepresentative of the relativities in professional occupations where most of the graduates were employed.

18 The TAFE publication does not provide an occupation by qualification breakdown for those in their first full-time jobs. It does provide total employment by occupation and qualification, however. We used the aggregate occupation by qualification breakdown to provide starting values for the breakdown of those in their first full-time jobs. We then used the iterative scaling technique described in Deming and Stephan (1940) and Purcell and Kish (1979) to estimate the first full-time job breakdown.

19 That higher education graduates are paid more than VET ones in the broader labour market has been demonstrated in countless studies. See Preston (1997) for a recent detailed Australian study.

20 Job seekers who worked full time were not necessarily in their first full-time job and may have considerable full-time experience. The average age of those working was 31.4 years, while that of TAFE graduates in their first full-time jobs was 23.4 years. Hence, the comparison may be unduly favourable towards job seekers.

21 The NCVER publication presents information about the employment outcomes of other disadvantaged groups. The proportion of those of Aboriginal and Torres Straight Islander

background employed was 49 per cent, those from non-English-speaking backgrounds, 62 per cent and those with any disability, 52 per cent—substantially below the TAFE average of 73 per cent. No comparable figures are published in GCCA (1999a).

22 Dumbrell et al. (2000) report similar findings about women's poorer employment outcomes than men's from an analysis of the 1997 TAFE destination survey. Their study includes the outcomes of focus group discussions about women's experiences in TAFE courses and their subsequent labour market experiences. The authors interpret many of the reported incidents as indicative of widespread discrimination against women.

23 The correlations between the relevant male and female columns for TAFE graduates' employment outcomes in table 7 are all around 0.7.

24 The difference is very small once they are adjusted for those in long-term full-time employment relationships.

25 Despite being a slight minority of enrolments (see table 1), females made up the majority of TAFE completions within the scope of the TAFE destination survey. Since they also had a higher response rate, females were over-represented among the TAFE destination survey respondents.

26 This contention is borne out in the data we use in section 6. Only 27 per cent of those males who completed an AQF Certificate III or trade certificate undertook a further course, compared to 46 per cent of those males completing other VET courses at the institution.

27 An analysis of unpublished occupational data from the 1997 TAFE GDS in Dumbrell et al. (2000) confirms this picture.

28 Where the desired post-course occupation is the same as the pre-course one, they may choose to undertake a course for non-vocational reasons. Where we know this, we can incorporate it into the analysis.

29 TAFE graduates from this institution were young relative to the national figures. Their average age was 27.6 years compared with the national average of 31 years.

30 Administrative data from the institution also seem to indicate that graduates who respond to the survey from the higher education sector do not differ fundamentally from non-respondents in terms of their observed characteristics, other than that females were more likely to respond than males. For example: 18 per cent of respondents were from non-English-speaking backgrounds, compared to 22 per cent of non-respondents; 31 per cent of respondents were employed full time at the time of their last enrolment compared to 33 per cent of non-respondents; comparable figures for part-time work were 19 and 18 per cent; 55 per cent of respondents were undertaking their first post-school qualification compared with 56 per cent of non-respondents. Other comparisons showed comparable proportions. At least for the higher education sector survey, it seems that biases in the survey induced by non-response are unlikely to be significant.

31 The results are drawn from tables B.2 and B.3 in appendix B, where we also set out how inconsistencies in the data of the two sectors were resolved for this analysis. Four equations were estimated. One each for males and females in each sector.

32 An alternative approach that involved treating the 'full-time employed or not' and 'full-time study or not' decisions jointly by estimating a bivariate probit equation led to very similar results to those presented.

33 Strictly speaking, this comparison between the sectors came from estimating two equations—one for males and one for females covering graduates in both sectors—not the results in appendix B. The regression approach involves controlling both the observed characteristics that influence the outcomes as well as any unobserved features of individuals' choices of courses or sectors that influence those outcomes. The results for the employment equation suggest there were no qualification level selection effects influencing the full-time employment equation.

34 There is a potential 'initial conditions' problem here that could lead to biased parameter estimates. This problem is common in longitudinal data where previous observations of the dependent variable in an equation (working full time, here) are not strictly exogenous. When we used the obviously exogenous variables to predict these lagged full-time variables to include selection correction terms in the reported equation, they had no obvious effect on the parameter estimates and were insignificant.

35 This interpretation is supported by the equations predicting pre- and within-course full-time employment experience. Holding a previous qualification did increase the likelihood of working full time at those times. For those individuals, however, the employment experience dominated the qualification effect in the post-course employment equation. The effect picked up in the post-course employment equation is that for individuals with a prior qualification who were not previously working.

36 Such an effect is evident for both males and females in the national TAFE destination survey. For both males and females, post-course employment rates were higher among those unemployed or not in the labour force who had no previous qualification than among those who did (see GCCA [1999a] table 14).

37 In contrast to the employment equations, selection effects were important in these equations and incorporating them had the effect of raising the returns to specific qualification levels. This result is consistent with those of Vella and Gregory (1996).

38 This is reported on a five-point scale. Normalisation involved subtracting the mean overall assessment for the institution from the individual's assessment and dividing by the standard deviation. The results were little different when dummy variables for the 'strongly agree' and 'agree' response categories were used in place of the normalised variable.

39 It is possible the factor reflects the graduates' assessments of the skills they developed during the course. While the greatest weight was given to the prompts about the quality and availability of equipment *to practise your skills*, other prompts that were given considerable weights were assessments of the instructors' knowledge, the presentation of course material and the balance between instruction and practice. While we retain the *facilities* name as our way of describing this factor, we note that it may be problematic.

40 The first equation involved estimation of a bivariate probit equation. That is, the two binary outcomes were treated as being determined jointly by individuals. The subsequent equations were estimated as separate univariate probit equations. That is, any relationships between the subsequent course characteristics were ignored, though relationships with the first bivariate probit equation were incorporated through the selection terms.

41 Where we did allow for possible relationships between the chosen course characteristics, the selection effects arising from the first bivariate probit results dominated those effects. The main technical problem not resolved was the correct estimation of the parameter standard errors, a general problem with this literature, but compounded here because there were multiple constructed correction terms and the principle equation is non-linear (see Greene 1997, p.465–472).

42 We used a 't-value' cut off of 1.5 as the criterion for inclusion in table 11.

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APPENDIX A
Derivation of the Skill Index

The index is constructed identically to the DEET (1991) skill index. It provides a skill-related weight for occupations based on the proportion of individuals within each occupation who have various levels of qualifications. Individuals with higher degrees receive the greatest weight in the construction of the index, while those without post-school education or training qualifications are ascribed negative weights. The index was constructed so that the average job in the 1996 Census had an index score of zero. The procedure was described in Aungles and Karmel (1990) in deriving the ASCO I values from the 1986 Census and earlier in Bureau of Labour Market Research (1987) for the previous ABS occupational classification.

The derivation of the index assumes that individuals' skills are directly related to their qualifications and that the possession of skills across those employed can be represented by the standard normal distribution. The proportions in the workforce with various qualification levels were then fitted under the standard normal distribution, with the means of each interval assigned to the respective qualification levels. These are presented in the first column of table A.1.

We then multiply these qualification loadings by the proportion in each occupation with that qualification to derive a skill ranking of occupations. This ranking and the proportion of the work force in the occupations were then used to determine the occupational skill index value, once more using the standard normal distribution. The occupational index values therefore reflect the occupations' positions in the overall ranking and occupational employment shares. For example, the sub-major group 'health professionals' (medical practitioners, nursing professionals and miscellaneous health professional) has a skill index value of 1.40. This translates, via the standard normal distribution, to suggest that jobs in that group were, on average, more skilled than 92 per cent of all jobs in 1996.

Weights for the skill index for ASCO I were published for occupations at a disaggregated level in DEET (1991). In the derivation of the index presented here, the occupations used were ASCO Second Edition sub-major level occupations. The skill index values for these occupations appear in table A.2. For the example given above, health professionals, a more disaggregated analysis would push the value for medical practitioners higher and for nursing professionals lower. Index values at the major group level appear in table A.1. These are employment-weighted averages of the sub-major level occupations, with the exception of the 'managers and administrators' major group.

For that major group, we excluded the sub-major occupation 'farmers and farm managers', which has a very low skill index value (-0.58) relative to other occupations in that group. None of the courses at the institution we analysed in section 6 are directed towards that occupation, nor is it a substantial focus of VET courses more generally. However, its inclusion in the major group reduces the index value to 0.38, equivalent to that of the associate professionals and tradespersons major groups. Our assessment is that the higher figure is a better reflection of the relative skill level of 'managers'. In regression analysis of occupational outcomes we utilised the ordinal ranking of occupations in the last column of table A.1.

Table A.1: Skill index derivation—qualification weights and major group skill index values

Qualification	Weighting	Major group skill index values		Ranking
Higher degree	2.409	Managers & administrators[a]	0.754	2
Post-graduate diploma	1.877	Professionals	1.484	1
Bachelor degree	1.320	Associate professionals	0.365	3
Diploma	0.861	Tradespersons	0.377	3
Skilled vocational qualification	0.507	Advanced clerical & service workers	-0.282	4
Basic vocational qualification	0.262	Intermediate clerical, sales & service workers	-0.219	4
No post-school qualifications or inadequately described	-0.666	Intermediate production & transport workers	-0.790	5
		Elementary clerical, sales & service workers	-1.194	5
		Labourers & related workers	-1.648	5

Note:

(a) The managers and administrators major group value excludes the sub-major group occupation farmers and farm managers

Table A.2: Sub-major group skill index values

Occupation	Skill index	% of employ-ment	Occupation	Skill index	% of employ-ment
24 Education professionals	2.12	4.4	59 Oth. adv. clerical & service wkrs.	0.05	1.7
20 Professionals nfd	1.70	0.3	62 Intermediate sales & rel. wkrs.	0.00	1.9
21 Science, bldg. & engineering profs.	1.60	1.7	46 Skilled ag .& horticulture wkrs.	-0.03	0.8
23 Health professionals	1.40	3.5	45 Food tradespersons	-0.05	1.1
25 Social, arts & misc. professionals	1.22	2.9	60 Int. cleric,sales & serv. wkrs. nfd	-0.07	0.1
22 Business & information profs.	1.04	4.5	63 Intermediate service workers	-0.13	5.1
12 Specialist managers	0.88	3.9	61 Intermediate clerical	-0.32	9.0
31 Science, eng. & rel. assoc. profs.	0.78	1.6	81 Elementary clerks	-0.45	1.0
50 Adv. clerical & service wkrs. nfd	0.75	0.0	51 Secretaries & personal Assistants	-0.50	2.6
34 Health & welfare associate profs.	0.74	0.7	13 Farmers & farm managers	-0.58	2.6
11 Generalist managers	0.70	1.8	83 Elementary service wkrs.	-0.63	1.1
43 Electrical & electronics trades	0.64	1.8	73 Road & rail transport drivers	-0.69	2.9
41 Mechanical & fabric'n eng. trades	0.58	2.3	71 Intermediate plant operators	-0.77	1.6
42 Automotive tradespersons	0.52	1.6	70 Int. prod'n. & trans. wkrs. nfd	-0.80	0.2
40 Tradespersons & related wkrs. nfd	0.50	0.2	79 Other int. prod'n. & t'port. wkrs.	-0.84	2.3
32 Business & admin. assoc. profs.	0.45	3.4	72 Intermediate machine operators	-0.91	1.6
10 Managers & administrators nfd	0.39	1.0	Occupation not stated	-0.98	1.7
44 Construction tradespersons	0.34	2.8	99 Other labourers & related wkrs.	-1.10	3.8
30 Associate professionals nfd	0.30	0.1	80 Elem cleric,sales & serv wkrs nfd	-1.19	0.0
49 Other tradespersons & rel. wkrs.	0.26	2.5	82 Elementary sales workers	-1.39	6.8
39 Other associate professionals	0.22	1.0	92 Factory labourers	-1.76	2.1
09 Inadequately described	0.19	0.9	91 Cleaners	-2.13	2.3
33 Man'g. supervis. (sales & service)	0.13	4.4	90 Labourers & related wkrs. nfd	-2.82	0.6

Note:

nfd: not further described

Source: Author estimates and ABS (1996) unpublished data

APPENDIX B
Data and econometric results

In table B.1, we set out the definitions of the variables in the two GDSs and how various inconsistencies between the destinations surveys of the sectors were resolved in constructing the data set from the institution we analysed.

Table B.1: Data definitions and construction of institutional data set

	Non-English-speaking background
Higher Ed.	Do you come from a non-English-speaking background?
VET	Did either of your parents speak a language other than English as their first language?
	Highest previous qualification
Higher Ed.	Post-grad = 7; Bachelor = 6; Undergrad dip = 5; High school = 0; Other qualification = 2
VET	Bachelor or higher = 6; Undergrad dip = 5; Ass dip = 4; Trade cert = 3; Other cert. = 2; Other qualification = 1; No post-school = 0.
	In estimation, this categorisation was condensed to 'held a post-school qualification or not'.
	Qualification completed
Higher Ed.	Followed GCCA classification: PhD = 10; Masters = 9; Post-grad dip. or cert. = 8; Bach Hons = 7; Bach Pass = 6; Undergrad dip. = 5
VET	Put into AQF levels, using table 7a, page 209 of NCVER 1998, i.e. Diploma or above = 4; AQF IV or equivalent = 3; AQF III or equivalent = 2; AQF I & II = 1; Other = 0.
	In estimation, some of the lower qualifications were condensed and separate dummy variables were used.
	Qualification of subsequent study
Higher Ed.	Certificate or other categorised as AQF Cert. IV or equivalent. Otherwise qualifications were categorised as in the qualification completed variable.
VET	Categorisation as for qualification completed, except undergraduate diploma is treated as a diploma.
	Full time or part time in subsequent study
Higher Ed.	Students indicated themselves whether they were full or part time.
VET	The TAFE survey asks the hours of classes per week. We assumed full-time study involved 20 hours or more at most institutions or 11 hours a week or more at a university.
	Hours of work
Both	Graduates report usual weekly hours in main job.
	Permanent/casual job
Higher Ed.	Whether job likely to last for twelve months or less.
VET	Whether graduate was entitled to sick leave or holiday leave.

Table B.1: Data definitions and construction of institutional data set (cont.)

	Final year employment
Higher Ed.	Relates to final year employment. Graduates respond directly whether it was full or part time.
VET	Relates to employment in final semester. Graduates indicate the hours worked within ranges.
	Pre-course activities
Higher Ed.	For HE, we assumed graduates were: at school if *age* minus *course length* was less than 19 years; worked full time if full time in last year and *age* minus *course length* was 19 years or more, and in other study if did not work full time in last year and *age* minus *course length* was less than or equal to 25.
VET	For VET, graduates indicated whether they were in school or other forms of study and/or working in the six months before starting their course.
	Full time/part time work
Higher Ed.	Based on responses of individuals of the hours they actually worked. We treated anyone working 35 hours per week or more as a full-time worker. Those working fewer hours were part time.
VET	As for higher education.
	Occupation
Higher Ed.	The data are coded as ASCO II and ranked as in table A.1.
VET	The data are coded as ASCO I and we use a ranking of occupations for ASCO I equivalent to the ranking in table A.1 as: 1: professionals; 2: managers and administrators; 3: para-professional and tradespersons; 4: clerical workers; 5: salespersons and personal service workers; plant and machine operators; labourers. Exceptions are that we re-coded some ASCO I occupations to their ASCO II equivalent: managing supervisors (15) and investment, insurance and real estate salespersons (61) to the assoc. professional level; nurses (34) to professionals; sales representatives (62) and personal service workers (66) to advanced or intermediate service workers; and filing, sorting and copying clerks (54) to elementary clerical workers.
	Wages/salary
Higher Ed.	Gross (pre-tax) salary/52 weeks.
VET	Usual pre-tax earnings in main job, period covered (week, month).
	Field of study (initial and subsequent courses)
Higher Ed.	Broad field of study based on DETYA classification.
VET	For initial course, the broad field of study based on DETYA classification. For the subsequent course, graduates indicated whether it was in the same field as the initial course.
	Still with final year employer
Higher Ed.	Based on answer to 'are you still with that [final year] employer?'
VET	Based on answer to 'is the employer you have at 29 May 1998 the same one you had during the course (as reported in Q 31 [which refers to their last semester employer])'.
	Sandwich year
Higher Ed.	Supplementary questions on the institution's GDS asked whether individuals undertook formal work experience in their course.
VET	Not applicable.

Table B.1: Data definitions and construction of institutional data set (cont.)

	Age
Higher Ed.	Individuals report their age at April 30 1998.
VET	Taken from individuals' date of birth. Calculated at May 1998.
	Australian-born
Higher Ed.	Taken from institution's administrative data. GDS indicates only whether individuals are permanent residents of Australia or not.
VET	Answer to 'in which country were you born?'.
	Usual address
Higher Ed.	Taken from institution's administrative data. It is the individual's postcode of permanent residence.
VET	Recorded on file since it was provided by TAFE authorities to the consultant for mailing out the questionnaire.
	Studied full time or not
Higher Ed.	Taken from individual's response to question about attendance. Those answering 'wholly full time' only were treated as 'full time'.
VET	Individuals indicated how many hours each week that they usually attended classes. We assumed full time study involved 20 hours or more at most institutions or 11 hours a week or more at a university.
	Socio-economic status
Higher Ed.	Used postcode of usual address to assign ABS socio-economic status variables from 1991 Census (ABS 1994).
VET	As for higher education.
	Regional unemployment rates
Higher Ed.	Used postcode of usual address to assign individuals to ABS Labour Force Regions, then allocated the June quarter 1997 regional total unemployment rate and same sex unemployment rate. Rates were taken from DEETYA (1997). (Correlation with March 1998 = 0.8).
VET	As for higher education.
	Subsequent course (in same institution or sector)
Higher Ed.	Graduates report the name of the institution where they are studying which is coded.
VET	Graduates report the name of the institution where they are studying, but it was not coded in the file we used. Individuals identified where they were studying, so we used that information.

Source: GCCA (1999a); NCVER (1998); ABS (1994); DEETYA (1997); Author's categorisations

Table B.2: TAFE graduate probit equation explaining whether graduates were working full time or not[a]

Variable	Males[b]			Females		
	Coefficient	Standard Error	Coeff./ St.Er.	Coefficient	Standard Error	Coeff./ St.Er.
Constant	0.340	0.54	0.63	0.128	0.59	0.22
Age	0.011	0.01	1.01	-0.018	0.01	-1.79
Regional unemployment	-0.099	0.04	-2.56	-0.069	0.04	-1.76
Australian-born	0.361	0.18	1.96	0.367	0.18	2.03
Previous post-school qual.	-0.226	0.17	-1.31	-0.282	0.17	-1.70
Pre-course: worked FT	0.332	0.34	0.99	0.617	0.29	2.15
Pre-course: at school	0.428	0.19	2.29	0.902	0.20	4.51
In course: worked FT	1.038	0.23	4.43	1.076	0.29	3.77
In course: worked PT	0.074	0.21	0.36	0.169	0.20	0.84
Still with final year employer	0.713	0.19	3.82	0.198	0.18	1.12
Studied full time	0.214	0.19	1.14	0.043	0.19	0.22
Arts, humanities and social science	-1.177	0.34	-3.50	0.035	0.33	0.11
Business, admin. services, hospitality, transport	-0.774	0.29	-2.64	0.299	0.30	0.99
Education [c]						
Engineering, surveying	-0.373	0.27	-1.39	0.482	0.44	1.10
Health, community service	-0.280	0.44	-0.64	-0.144	0.32	-0.45
Law and legal studies [c]						
Science [c]	-0.363	0.99	-0.37			
TAFE multi-field study [c]				-0.132	0.47	-0.28
Number of observations		>400			>350	
Log likelihood function		-189.7			-200.1	
Restricted log likelihood		-277.5			-273.7	
Chi-squared		175.4			147.2	
Degrees of freedom		15			15	
Significance level		0.00			0.00	
Predictions						
% correct working full time		85.8			70.6	
% correct not working full time		62.6			80.1	
% correct		78.6			75.4	

Notes:

(a) Excludes individuals studying full time

(b) These equations survived tests for heteroscedasticity (non-constant variance). The correction procedure for the binomial probit model with multiplicative heteroscedasticity is set out in Greene (1998: 450). Elsewhere, Greene suggests the test may also pick up other forms of misspecification (1997: 890). Joint equations of males in both sectors and females in both sectors failed Wald tests for the equivalence of the parameters across both sectors, so the equations were estimated separately

(c) Blanks mean there were too few observations in the field of study for reliable estimation

Source: Unpublished institutional data

Table B.3: Higher education graduate probit equation explaining whether graduates were working full time or not[a]

Variable	Males[b]			Females		
	Coefficient	Standard Error	Coeff./ St.Er.	Coefficient	Standard Error	Coeff./ St.Er.
Constant	-1.143	0.44	-2.60	-0.242	0.36	-0.67
Age	-0.010	0.01	-1.12	-0.016	0.01	-2.31
Regional unemployment	0.018	0.03	0.65	-0.011	0.02	-0.60
Australian-born	0.031	0.13	0.23	-0.119	0.12	-1.02
Previous post-school qual.	0.030	0.13	0.23	-0.140	0.10	-1.37
Pre-course: worked FT	0.298	0.15	1.96	0.077	0.12	0.66
Pre-course: at school	0.102	0.28	0.36	0.988	0.19	5.28
In course: worked FT	2.257	0.28	8.05	1.852	0.19	10.01
In course: worked PT	0.771	0.12	6.20	1.091	0.10	10.61
Still with final year employer	0.110	0.13	0.83	-0.345	0.09	-3.92
Studied full time	0.473	0.13	3.78	0.296	0.10	3.01
Arts, humanities and social science	-0.731	0.22	-3.40	-0.485	0.19	-2.50
Business, admin, services, hospitality, transport	0.484	0.19	2.49	0.243	0.21	1.18
Education	-0.211	0.27	-0.78	-0.620	0.22	-2.82
Engineering, surveying	0.587	0.20	2.96	0.098	0.26	0.38
Health, community service	0.221	0.24	0.94	-0.397	0.20	-2.03
Law and legal studies	0.291	0.62	0.47	-0.089	0.33	-0.27
Science	0.384	0.21	1.80	-0.214	0.22	-0.99
'Sandwich' year	0.506	0.14	3.59	0.397	0.11	3.75
Number of observations		>1000			>1500	
Log likelihood function		-425.5			-776.8	
Restricted log likelihood		-646.3			-1055.2	
Chi-squared		441.6			556.8	
Degrees of freedom		18			18	
Significance level		0.00			0.00	
Predictions						
% correct working full time		88.6			78.5	
% correct not working full time		66.0			73.8	
% correct		81.3			76.3	

Notes:

(a) Excludes individuals studying full time. Includes graduates of all higher education level qualifications

(b) These equations survived tests for heteroscedasticity (non-constant variance). The correction procedure for the binomial probit model with multiplicative heteroscedasticity is set out in Greene (1998: 450). Elsewhere, Greene suggests the test may also pick up other forms of misspecification (1997: 890). Joint equations of males in both sectors and females in both sectors failed Wald tests for the equivalence of the parameters across both sectors, so the equations were estimated separately

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ISBN 0 87397 614 2